

In This Issue—*Flat Rate—Front Axle, Steering Gear*

# MOTOR AGE

Vol. XLIV  
Number 24

PUBLISHED WEEKLY AT THE MALLERS BUILDING  
CHICAGO, DECEMBER 13, 1923

Thirty-five Cents a Copy  
Three Dollars a Year

**Time was when dealers  
reckoned their success by  
the number of cars delivered.**

**Those were the happy days  
before we all got into the  
second hand business.**

**Now the more cars you de-  
liver the less you are likely  
to make.**

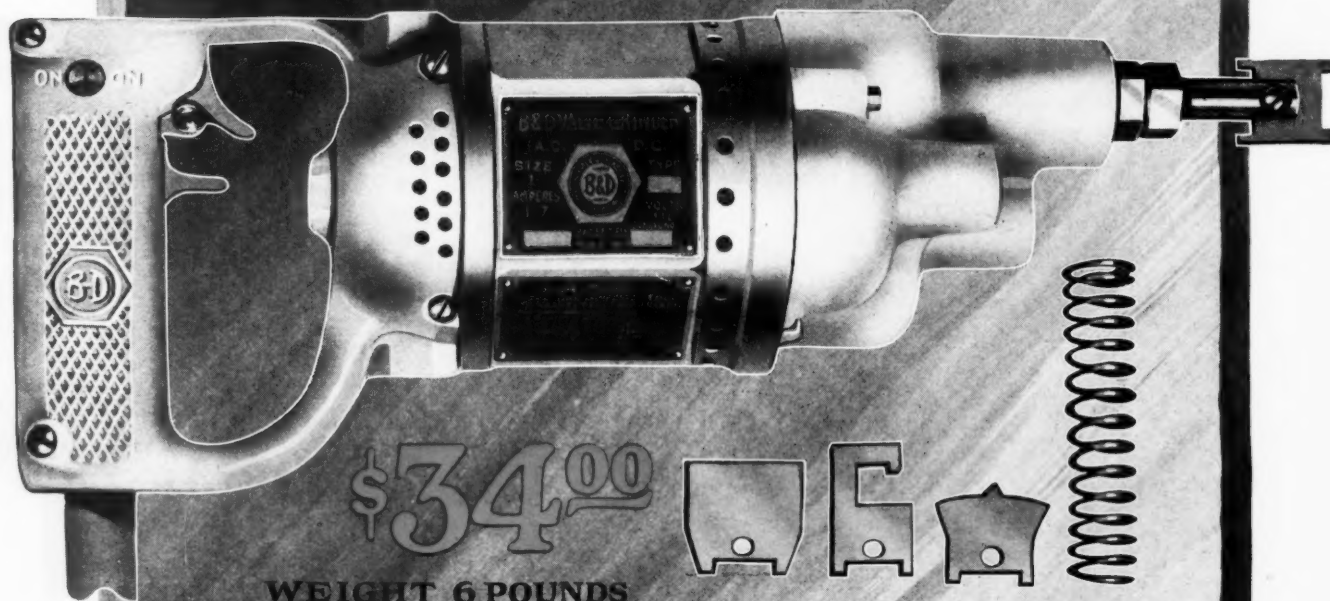
**Why?—write and I will tell  
you.**

*Edward S. Jordan*

President  
Jordan Motor Car Company  
Cleveland, Ohio

# NEW BLACK & DECKER ELECTRIC VALVE GRINDER

*"With the Pistol Grip and Trigger Switch"*  
at **REDUCED PRICE**



The New No. 1 Black & Decker Electric Valve Grinder is offered at the heretofore unheard of price of \$34.

This Electric Valve Grinder is generally similar to the previous Black & Decker Electric Valve Grinder which sold for \$45, but, in spite of the \$11 reduction in price embodies many refinements. It weighs but six pounds, has a double gear reduction, bronze connecting rod by means of which the long steady sweep back and forth is obtained, and the most improved form of *"Pistol Grip and Trigger Switch"*; also the new patented Black & Decker cord protector.

As the result of a number of years experience in building Electric Valve Grinders, we have worked out an ideal tool in the new No. 1. A tool which can be used with the greatest of ease and comfort by the mechanic, but which, nevertheless, will grind valves in about one-sixth the time required to do the job by hand.

Your own jobber carries these tools in stock. Ask him for a demonstration, or write us and we will have one of our jobbers nearby get in touch with you.



**THE BLACK & DECKER MFG. CO.**  
TOWSON, MD.



*"The Best-Equipped Shop  
Gets the Business"*

BACKGROUND PAT. PEND.  
B&D MFG. CO.



# Handles Wire and Disc Wheels as Easily as Split Rims!

**I**F YOU'VE ever wrestled an hour or two with a tire "frozen" to a wire or disc wheel or solid rim---trying to pry it off with the means available in the average shop---you'll appreciate at a glance how much time and labor this new Weaver Universal Tire Changer, Model "E," will save in your shop.

It's the only Tire Changer on the market that will handle all types and sizes of pneumatic tires (including the new "balloons" up to 7½ inches) and rims.

Mounted on your curb, you'll find it a splendid advertisement of your quicker and better service---an effective means of attracting to your shop the growing number of car owners who are unwilling to intrust their work to sledge hammer methods.

*If you handle any tire repairing, you'll be interested in reading our circular completely describing this new equipment. Write for it today.*

**WEAVER MFG. CO., Springfield, Illinois, U. S. A.**

**Weaver Canadian Co., Ltd., Chatham, Ontario**



The  
new  
**WEAVER**  
UNIVERSAL  
**Tire**  
**Changer**  
Model "E"



*The best equipped  
shop gets the  
business*



Patented  
March 20, 1910  
May 2, 1922

OIL-REGULATING TYPE, \$1.00 EACH

One to a piston

Up to and including 5 in. diameter  
COMPRESSION TYPE, 25c and up

## Why They Have A Bigger Market

THE reason why PERFECT CIRCLE Oil-Regulating rings outsell other rings—as high as five to one in many garages—is not generally understood. But it is clear when you study the PERFECT CIRCLE principle.

Only a small portion of motors are “bad oilers”—but *most* motors use too much oil. They need oil-regulation—oil economy. In such cases PERFECT CIRCLES pay for themselves in oil saved alone.

PERFECT CIRCLES insure positive lubrication of the cylinder walls—and return *surplus* oil to the crank-case to be used over again, by a simple patented principle found in no other ring! It is this principle which enables them to give 1,000 or more miles to the gallon of oil.

In bad oilers their work is more spectacular, but garagemen have found—as *you* will find—that the cars that “just use too much oil”, constitute an even greater market. Write for a trial set. Almost every car needs them.

Indiana Piston Ring Company, Hagerstown, Indiana

Harkrader & Harkrader: Western Sales Agents

1603 S. Michigan Ave., Chicago

Marketed through recognized automotive jobbers, only.

# PERFECT CIRCLE

## Oil-Regulating Piston Rings

# MOTOR AGE

Reg. U. S. Pat. Off.

Published Every Thursday by

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## Mr. Dealer: your needs wrote the Goodrich 1924 Proposition

WE set out to shape a contract that would underwrite a prosperous 1924 for dealers; and we did it. We let the needs of the dealer write the items and articles of it.

The foundation of the contract is a universal price to all contract dealers, backed by a liberal dating during the winter with complete price protection. When a dealer signs the Goodrich 1924 contract, he knows that he is getting the best prices Goodrich quotes to anybody; and nobody can undersell him on Goodrich Tires.

With Silvertowns, the tire of supreme quality, at unheard of prices—Commander Cord, challenger of all low-price competition—and Goodrich "55", a fabric unrivaled in quality at a price a dealer can defeat competition without carrying a burdensome stock. Goodrich branch house distribution assures him quick replacements, hence rapid turn-over.

Now is the time to make the right connection with the right manufacturer. Learn the personal advantages the Goodrich Proposition offers you. Write the nearest Goodrich Branch for full particulars.

THE B. F. GOODRICH RUBBER COMPANY  
ESTABLISHED 1870

# Goodrich

## TIRES

"Best in the Long Run"



# You dealers in high priced cars —

"Our first sale was to a gentle-  
man who owns two Packards."

H. CLAY BROWN,  
Shreveport, La.

"—several sales to bankers  
who own Wintons and Pierce-  
Arrows."

RAMSEY MOTORS  
Kansas City, Mo.

"Sold a Coupe to a man who  
drove up in a Daniels, and  
said he also owns a Peerless."

OLDSMOBILE PITTSBURGH CO.  
Pittsburgh, Pa.

See what our dealers are saying about sales of the Oldsmobile Six to owners of higher priced cars. If we had the space we could quote dozens of similar statements.

Why don't you add the Oldsmobile Six to your line? You will draw trade from those who wish to step up from a four to a six, and you will also appeal to those who own, or have formerly owned, high-priced cars.

Fisher bodies, Delco ignition, Borg & Beck clutch, Alemite lubrication and Harrison radiator are just a few of the quality units of Oldsmobile Six. Its 18-foot turning radius, its light weight, long spring suspension and economy of operation make it easy to sell.

No question about the *quality*, and the *quantity* is assured by our big factory production.

Touring Car	\$750	Cab	\$955
Roadster	750	Coupe	1035
Sport Touring	885	Sedan	1095

The G. M. A. C. extended payment plan makes buying easy. All prices f. o. b. Lansing

OLDS MOTOR WORKS  
LANSING, MICHIGAN

## OLDSMOBILE - SIX

PRODUCT OF GENERAL MOTORS

# STUDEBAKER



## Consistency

The Studebaker dealer has a consistent sales argument because Studebaker specializes in Sixes.

He is not subjected to the customary embarrassments which dealers must suffer who have to switch their customers from one car to another, of more cylinders or fewer cylinders—or to a different name on the radiator.

In other words, the Studebaker dealer does not have to talk against himself or get tangled up in the conflicting sales points of different types of cars.

He sells nothing but Sixes and can talk convincingly on the superiorities of the Six.

It is not difficult to sell the prospect on Studebaker's reputation for quality, value and integrity. This has been in the making for 71 years.

When the buyer is convinced of six-cylinder advantages and of Studebaker superiority, he can be fitted with a car of the size, style and price that will exactly suit him.

And when he comes to buy again, the Studebaker dealer can fit him again—and again—and repeat business is not only profitable but comes with little or no effort.

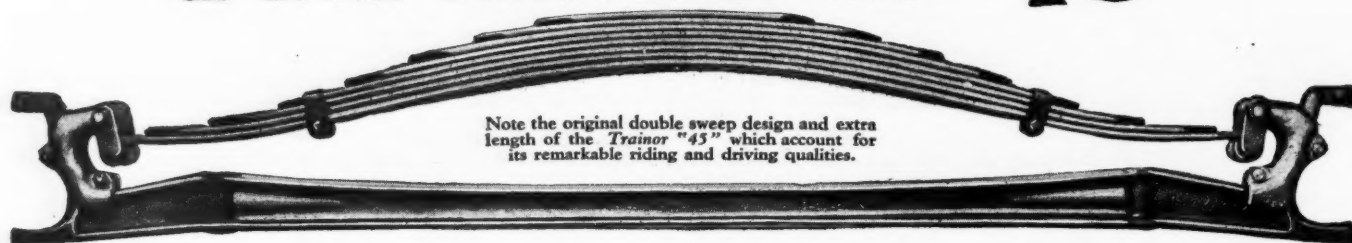
Studebaker dealers can make life-time customers and life-time friends out of every transaction.

There are many other advantages that make the Studebaker proposition the most attractive in the industry. You may have the details whenever you say.

THE STUDEBAKER CORPORATION OF AMERICA  
South Bend, Indiana

1924 MODELS AND PRICES—f. o. b. factory		
LIGHT-SIX 5-Pass., 112" W. B., 40 H. P.	SPECIAL-SIX 5-Pass., 119" W. B., 50 H. P.	BIG-SIX 7-Pass., 127" W. B., 60 H. P.
Touring.....\$995	Touring.....\$1350	Touring.....\$1750
Roadster (3-Pass.).....975	Roadster (2-Pass.).....1325	Speedster (5-Pass.).....1835
Coupe-Roadster (2-Pass.)1195	Coupe (5-Pass.).....1895	Coupe (5-Pass.).....2495
Coupe (5-Pass.).....1395	Sedan.....1985	Sedan.....2685
Sedan.....1485		

# TRAINOR '45"



Note the original double sweep design and extra length of the *Trainor '45'* which account for its remarkable riding and driving qualities.

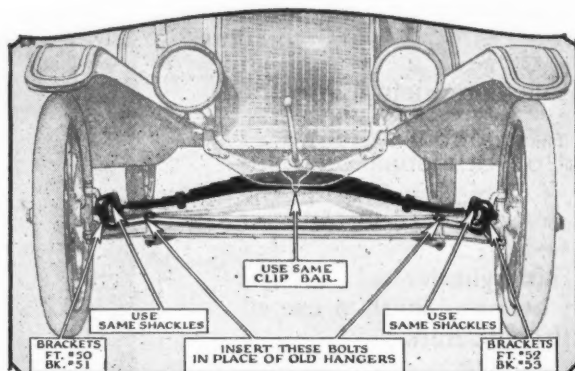
## *The Shock-Absorbing Front Spring* for FORDS

# A Big Money-Maker for Dealers

ASSURING comfort, ease and safety in Ford driving never known before, the *Trainor '45'* appeals to Ford owners everywhere, and offers a big money-making opportunity for dealers.

Because of its original double sweep design and extra length, it absorbs within itself all ordinary shocks of the road, and performs the functions of spring and shock-absorber combined. On jolty roads, in treacherous sand or mud, the Ford equipped with a *Trainor '45'* rides as smoothly and steers as easily and safely as a heavier car.

Best of materials—skilled workmanship—the unqualified *Trainor* guarantee of satisfaction—the advantages assured the Ford owner—and the unlimited market combine to make the *Trainor '45'* one of the most profitable items offered to dealers in a long time. Write at once for sales proposition.



### Note How Easily the *Trainor '45'* Is Installed

**FIRST**—Jack up front of car, remove hanger bolts from radius rod, install special bolts to hold radius rod in position, and remove old spring.

**SECOND**—Attach bracket hangers for *Trainor '45'*. Parts Ft 50 and Bk 51 (front and rear respectively) are for right end of axle. Parts Ft 52 and Bk 53 are for left end of axle. Do not tighten until spring has been installed.

**THIRD**—Install the *Trainor '45'*, using end shackles from old spring. Tighten shackles, then the bracket bolts.

**FOURTH**—Fit spring under radiator, and lower car to rest on spring. Then apply clip plate under spring and tighten nuts on clip. With the 8-leaf spring (for roadsters and touring cars) the old clip plate is used. If the spring is a 9-leaf (for coupes and sedans), or a 10-leaf (for trucks), a special indented clip plate is supplied.

TRAINOR NATIONAL SPRING COMPANY  
New Castle . . . . . Indiana



"The Trainor Way", an improved method of handling replacement springs, is making more money for jobbers everywhere. Write for it.





# *Your New* MARMON *Market*

Marmon's announced reduction of \$400 on an automobile which to many thousands of motorists is the quality-ideal, means the opening up of a greatly increased market to the sales-room which features the Marmon franchise.

To the smaller town particularly, this reduction makes the opportunity to sell Marmon cars doubly attractive.

Our many records of selling successes in small towns at the former price, reinforces the experiences of dealers in such towns at the new low price.

## \$2785

Phaeton, f. o. b. Factory

NORDYKE & MARMON COMPANY

*Established 1851*

INDIANAPOLIS, INDIANA

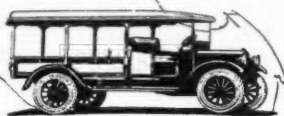
# MARMON





## The Broadest Sales Field

For automobile buyers, in winter and summer, are the *New High Powered Reo Sixes* - 5 models, open and closed.



The *Speed Wagon*, the world's greatest commercial car, dominates truck sales. Supplied in twelve body styles.

Taxicab buyers are increasing in number. The *Reo Taxicab* is revolutionizing the taxicab industry and taxicab prices.



*Reo Busses* permit dealers to share in this growing business, marked by high profit-possibilities.

The *Speed Wagon Parcel Delivery* provides a de luxe, compact and rapid vehicle for the city merchant who values smartness.

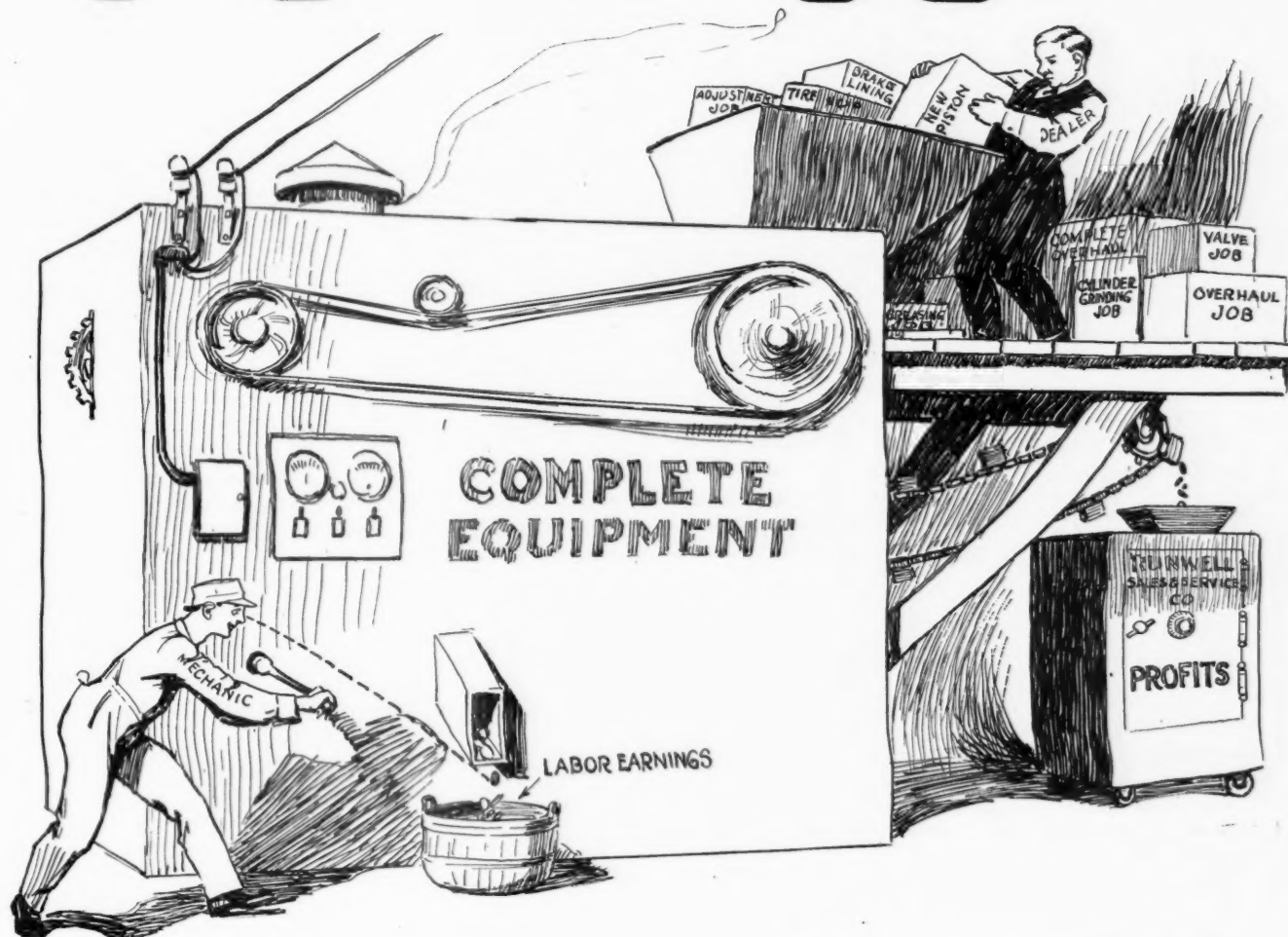


All Designed and Manufactured in the Big  
Reo Shops,—Not Assembled!

The valuable Reo sales franchise is open in a few territories. Applications should be made immediately.

**Reo Motor Car Co.**  
**Lansing,**  
**Michigan**

# MOTOR AGE



## Shop Equipment a Direct Means for Making Greater Profits

*Mechanics Represent Definite Number of Hours of Labor Which Cannot Be Stretched by Dealer. Their Output Can Be Controlled Through Proper Machinery and Tools. Making Possible an Increase in Number of Shop Jobs*

By B. M. IKERT

SINCE the number of cars on the road has made maintenance the biggest division of the great automotive industry, it is interesting to note the progress that is being made in the economics of this field. Everywhere there are splendid examples of efficient and economic selling and performing of maintenance. These examples are as yet somewhat isolated but by example and competition these efficient shops are having a beneficial effect.

But despite these notable examples, probably forty

per cent of all the service stations, including dealer and independent repair shops, are not properly equipped to sell maintenance or supply service on an economic basis. And this in the face of the fact that the number of vehicle registrations per service station or repair shop has steadily increased.

We now have over 190 vehicles per shop, whereas we had about 140 in 1919. Also back in that year some 40 per cent of all the shops were operated by independents, that is those who held no dealerships for cars. The



other 60 per cent of service stations were operated by dealers. To-day we have just about the opposite condition. We have more independent shops than service stations operated by dealers.

This means that independent shops have profited by the opportunity and vehicle dealers did not see in the growing demand for maintenance the prospects for a greater profit if they would equip their shops for this business.

The maintenance customer is primarily the dealer's customer first. If the dealer would equip his shop properly he could hold much of this trade. Too many dealers overlooked the vital factor of dove-tailing service with sales. They were the ones who made arrangements with the repair shop back in the alley to "handle all their service". They were the dealers who said of shop equipment, "We don't need any because we don't handle service at all". Can you beat that?

Can you imagine a Runwell salesman fussing around for several days with a customer to sell him a car and then when something goes wrong with that car and the customer seeks the salesman, the latter tells him he must take the car over to the North Star Garage back in the alley as "we have nothing to do with service"?

The North Star Garage probably "handles service" for a half dozen other dealers representing as many makes of cars and doesn't care a tinker's damn whether or not the Runwell dealer sells a customer another new car later on. This shop is getting work from all dealers and all customers look alike.

#### *Failures Through Lack of Equipment*

The majority of dealer failures have been due to failure of rendering the right kind of service through lack of equipment. Figures indicate that about one-third of all the dealers in the country are not equipped for servicing the cars and trucks they sell.

It is a known fact that a considerable proportion of the car dealers who are being appointed to-day are those who have in the past operated an independent repair shop of the better class. These men recognize the importance of maintenance and in many cases have tooled up with machinery costing anywhere from \$10,000 to \$15,000.

Equipment to sell proper service and maintenance means more than machinery in the shop, of course, but in this article emphasis will be placed particularly on shop equipment, for the following reasons:

- 1—Shop equipment is of utmost importance in the use of the flat rate system.
- 2—It is the direct means for the shop making more money.
- 3—It makes possible better and more accurate work.
- 4—It eliminates the so called "helper".
- 5—It builds a better shop morale.
- 6—It makes possible the class of work demanded more and more by a public rapidly becoming motorwise as to results, at least.

We have in various articles talked about the place of shop equipment in the furtherance of the flat rate system. The shop is the determining factor to a very large extent as to whether or not you can successfully use the flat rate system in selling your customers and having your men work on a piece work or premium basis.

At the present time there are flat rate systems which have been worked out by factories, distributors and dealers. In most cases these flat rate operations have been worked out under conditions approximating those found in shops not any too well tooled up. For instance, in some systems where the time is listed for a valve grinding job, it is done with the assumption that there is no machine for refacing the valves and seats and that the valves will be ground in by the usual screwdriver method.

Now here's where shop equipment comes in. Suppose the flat rate operation calls for 5 hrs. time under the hand method. Assuming that the shop sells its labor at \$1.25 per hour, the price of the job to the customer would be \$6.25.

If the dealer bought a valve refacing and reseating tool, and an electric valve grinder the shop could turn out the job in, say, 2½ hrs., meaning that more work can be done in a given time than formerly. Obviously the shop would not charge for 2½ hrs. work, but the flat rate of \$6.25, even though it had been done in half the time. It is fair.

It is just as fair as the case of a certain brewery which at

one time spent some \$15,000 or \$20,000 on machinery which would clean and fill more bottles per hour than the former system had done. But you did not see any reduction in price of beer.

Nor should there be any reduction in the price of the valve grinding job mentioned above, providing the flat price is commensurate with the work involved. The less time required for the job is to an extent offset by overhead involved in the cost of the equipment.

Shop equipment therefore, is the direct means of making more money. In many shops where the men are working piece work they evolve time saving methods of all descriptions. Why? Because anything they can do to speed up their work and yet be assured that the work is well done, makes just that much more money in their pay envelopes. It means also that more work is done in a given time and getting more volume and sustaining this volume is what makes the shop pay these days.

#### *More Work and Better Work*

The mechanics in the shop represent just so many hours of time every day and this time cannot be stretched by any dealer. Four men working 8 hours a day in the shop give 32 hours of time no matter how you look at it. You cannot make it any more. But the work these men do can be controlled. Four men working 32 hours with little or no equipment may do an average of say, 16 jobs a day. This might be increased to 24 jobs a day, or even more, and there is just one way to do it—shop equipment.

Shop equipment makes possible not only more work, but better and more accurate work. In fact you cannot do a real job, in most cases, if equipment is not at hand, you will only work at it. Who can do a good job of renewing bushings in a front axle if a press and proper reamers are not available? Who can test and true up a crankshaft without a surface plate, V-blocks, micrometers and a dial gage?

Who can dismantle and reassemble an engine properly without that engine being held in an engine stand, so the mechanic can work in a comfortable position and reach all parts more easily? Who can straighten the I-beam of a front axle that has been in a wreck, unless he has a large vise, bending bars and perhaps a forge?

Who would think of filing the bushings in a piston to install oversize wrist pins? What mechanic would think of putting together an engine without lining up the rods and pistons with the proper fixture? And what shop can get along without an electric drill, an air compressor, a shop crane, and a cleaning tank? And there are the many other items including wheel pullers, special wrenches, reamers, etc.

Shop equipment eliminates the so-called "helper". Just what excuse there is for a helper around a first class mechanic working on the piece work system, is hard to see. Give the good mechanic the right kind of surroundings as to equipment and materials and he never will have need for a "helper".

Even in the best shops to-day, the mechanics employed on the piece work plan are doing their own cleaning of parts, tearing down and reassembling much of which formerly was done by helpers, gifted especially in the art of "stalling around".

The advent of the piece work system, together with an excellent line of shop equipment which the market now affords has had the effect of mechanics organizing themselves better for their work, to the exclusion of the notorious "helper".

#### *Equipment and Shop Morale*

All of this naturally has a good effect on the shop morale. Invariably you will find that the shop which is well equipped and manned has a better morale or atmosphere than the shop not so operated. Many dealers are proud to show their customers the shop, but always, such a shop is well conducted, lighted and equipped, otherwise the dealer would not be so willing to show it.

The public is getting motorwise. The flat rate has come into its own and the dealer equipped to render the best service and sell maintenance intelligently is the one who survives.

Next week's issue of MOTOR AGE will contain the second section of this article in which there will be discussed, what equipment to buy at the start, and what equipment should be added from time to time.

## New Essex Six Designed to Provide Maximum Performance at Useful Speeds

*Body Lines Retain Characteristic Essex Features But New Six Is Lower and Roomier. Engine of the L-Head Type With Circulating Splash System of Oiling. Five Passenger Phaeton Priced at \$850 and Coach at \$975*

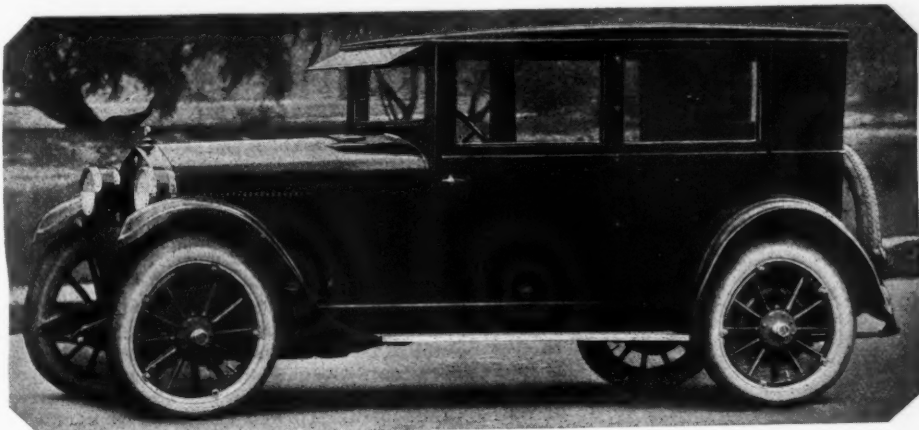
**T**HE new Essex six, the Hudson-built product which supersedes the previous four-cylinder Essex, is now on the market. This new model, which brings the Hudson company into the ranks of those building exclusively six-cylinder cars, has been designed to provide maximum performance at useful speeds. Although the price is below \$1,000, the Hudson company states that price has not been the first consideration in the development of this model. Two body styles will be provided, a five-passenger phaeton at \$850 and a coach at \$975.

While in general the lines are somewhat like those of the old Essex, there are marked differences. The peaked radiator blending into the straight line body lines without a bevel edge is new and yet, the car at a general glance will be identified as an Essex because of the retention of many of the general characteristics of the previous Essex. The coach is similar to the previous Hudson and Essex coaches but, while mounted on the new, lower, 110½ in. wheelbase chassis, has more leg and head room.

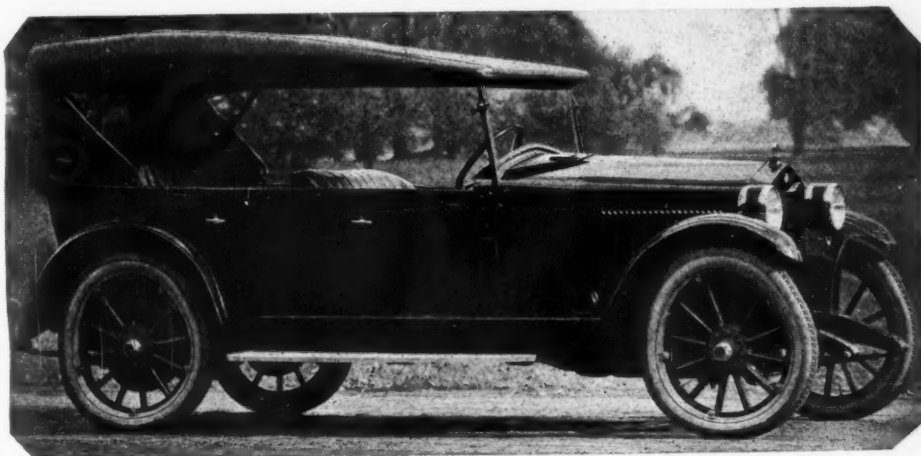
### Entirely New Powerplant

The powerplant is distinctly new throughout and differs materially from the preceding Essex not only in being a six instead of a four, but being of L-head type. It has a bore and stroke of 2½ by 4 in., providing a piston displacement of 130 cu. in.

The writer drove one of the new models over the roads around Detroit and found a speed range of from 3 to 55 miles an hour on high gear with an acceleration of 5 to 25 miles an hour in 11 seconds. Due to the low center of gravity of the car, obtained by the low mounting of the body, which will be explained in detail later, and the arrangement of the spring suspension, a marked



New Essex coach mounted on the six-cylinder, 110 1-2 in. wheelbase chassis, with 31 by 3 3-4 in. tires, listing at \$975



New five-passenger six-cylinder Essex phaeton mounted on 110 1-2 wheelbase with 31 by 3 3-4 in. tires, listing at \$850

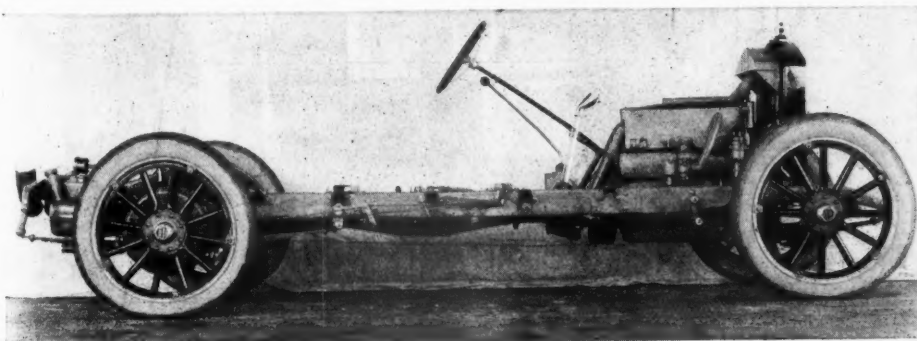
ability to hold the road was noted under some particularly adverse conditions encountered during the drive. A gasoline economy of better than 20 miles per gallon is claimed by the manufacturers,

who state that this estimate is quite conservative.

The six L-head cylinders are cast in a block integrally with the upper part of the crankcase. The combustion chambers are carried in the detachable head and are of the tapered section type with the high point of the combustion chamber above the valve chamber. The pistons come to ¼ in. from the barrel top. The compression ratio is stated to be moderate, although no compression figures are at this time available.

### High Maximum Car Speed

The engine peaks at 3300 r.p.m. and at this speed, with the standard gear ratio of 5.6 to 1, gives a maximum top speed of close to 60 miles an hour. The cylinder casting is a single flask type open on the valve cover side and so designed that, while the engine is completely enclosed, the entire valve action, as well as the principal units, are readily



Side view of Essex chassis. This view also illustrates the bracket for the body supported beneath the lower flange of the frame side rails, permitting the floor boards to be on a level with the upper flange. The space beneath the rear seat is utilized by the kick-up in the frame



available for inspection and service.

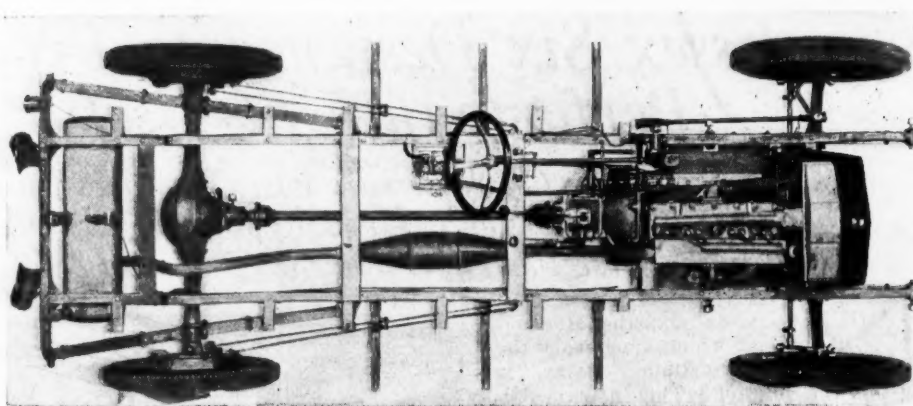
The engine is suspended at four points, the rear two points of suspension being to the main frame and the clutch housing and the front two points of suspension being secured in a novel and ingenious manner by means of a plate bolted to the front end of the block and anchored also to the main side rail. The metal plate, acting as a cross-member, is anchored to the block by six cap screws and in addition, by all of the cap screws which go through the front end chain cover plate, holding the cover plate in place and also acting as a tie between the cross-member and the block.

### Alloy Pistons Retained

Split aluminum pistons, similar in design to those used in the previous Essex, are employed. The piston material is Lynite and the pistons are equipped with three rings above the wrist pin. The pistons are  $3\frac{1}{8}$  in. in length. The connecting rods are I-beam, drop-forgings, and the crankshaft is a three-bearing type  $2\frac{1}{2}$  in. in diameter, the bearings lengths being, respectively,  $1\frac{1}{2}$ ,  $1\frac{1}{4}$  and  $1\frac{1}{4}$  in.

The camshaft is driven by a Morse adjustable silent chain  $1\frac{1}{2}$  in. in width. The chain drive is the triangular type, the drive being from the camshaft to the crankshaft and generator shaft, which also takes care of the oil pump and distributor. The camshaft is supported on three bearings and drives the valves through roller tappets. The roller tappet drive is similar to that used on Hudson cars and is manufactured to close limits. The roller guides and pins being ground all over.

The intake and exhaust valves are interchangeable and are  $1\frac{1}{2}$  in. clear diameter. The valve adjustment is on the side in the usual manner and is accessible by removing a cover plate, which is split at the center and the two halves held together by a leather binding piece, which permits the entire valve cover to fold out without the necessity for touching the carburetor which is mounted on the valve side.



Plan view new Essex six-cylinder chassis. Note the angularity of the rear spring suspension, also the bracket for supporting the body outside of the frame member, permitting the car to be brought close to the ground

The flywheel is a plain steel disk  $\frac{3}{8}$  in. thick, with the teeth for the starter gear cut directly in its periphery. The starter engagement is through a Bendix starter pinion. The entire electrical system, including ignition, starting and lighting, is American Bosch. The ignition is controlled by automatic advance, the advance being worked out to take care of the entire engine range, making unnecessary a hand control, which has been eliminated. This has simplified the control linkage and contributes to the cleanness in appearance of the powerplant.

### Circulating Splash Oiling System

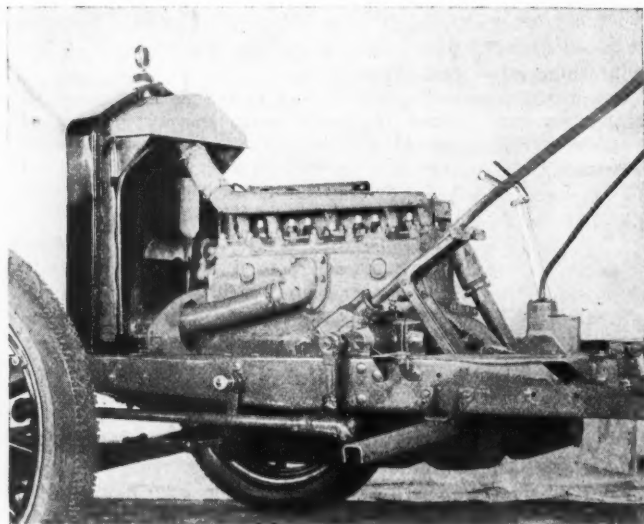
Lubricating is by circulating splash. The oil pump is geared down so that it is always working at effective speeds regardless of how fast the car is driven. This being a high speed type engine, reaching its peak horsepower at over 3,000 r.p.m., the oil pump characteristics have been studied, and a ratio devised so that the lubricant supplied is correct, in accordance with the speed. The oil is fed from the pump to the first splash trough immediately under the No. 1 cylinder. The splash from the connecting rod scoops practically empties the oil troughs at every revolution, throwing the oil into sloping channels or gutters

on the side of the reservoir and crankcase.

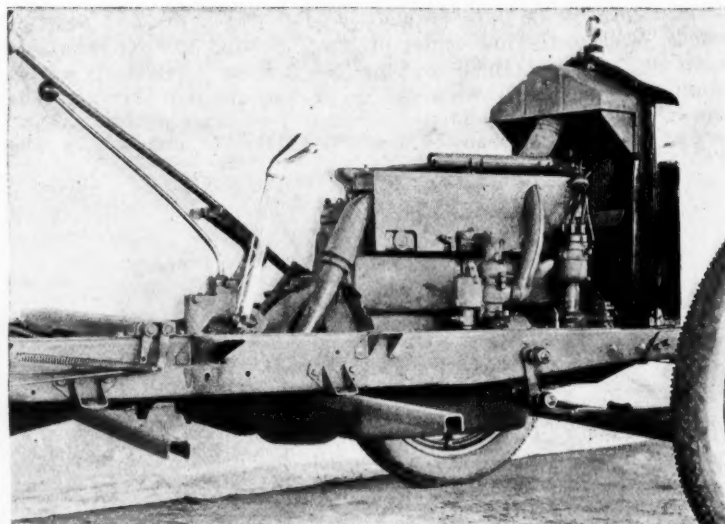
The upper gutters feed the main bearings in a continuous stream, the lower gutters feed the oil troughs. The oil from No. 1 trough is thrown directly into No. 2 trough. The splash from No. 2 oil trough feeds No. 3 and so on until No. 6 oil trough is reached, at which time the oil flows back into the reservoir. The connecting rod dippers are forged integrally with the connecting rods.

Cooling is by the thermo-syphon system with hand controlled shutters on the cellular radiator, putting the operating temperature of the motor directly under control of the driver. A MotoMeter is provided as standard equipment. The fan is a pressed steel, four blade unit driven by belt from the crankshaft.

The drive from the powerplant passes a Hudson design multiple disk-in-oil clutch with cork inserts, to a three-speed, sliding selective gearset mounted as a unit powerplant with the engine. The transmission gearset is housed in an aluminum case and is provided with Hyatt bearings on the main shaft and bronze bearings with circulating lubrication on the counter shaft. A neutral lock is provided as standard equipment.

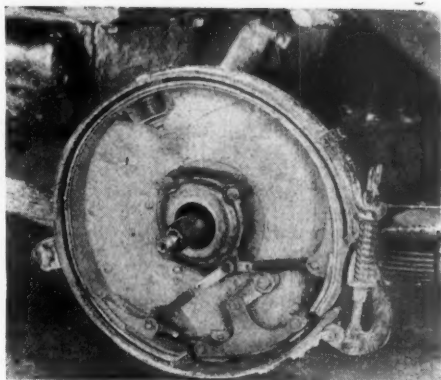


Left side new Essex six-cylinder powerplant. Note the sheet metal cross-member acting as the front support. This is drilled for the passage of the water intake pipe



Right side of new Essex six-cylinder powerplant. Note the pressed metal cover over the exhaust manifold acting as hot-air box for carburetor air intake





*Brake on Essex car. This operates on 14 1/2 in. drums. This illustration also shows the accessibility of the adjustment of the external brake*

### Hotchkiss Drive Retained

From the transmission, the drive is taken through a tubular propeller shaft and two Spicer universals to a semi-floating rear axle mounted on Timken bearings throughout. This axle is quite similar to that which was employed on the previous Essex with the exception that shim adjustments instead of the screw type adjustments are now employed making the adjustment more durable. The drive is Hotchkiss.

Fully adjustable brakes with 14 1/2 in. diameter drums, with 1 1/2 in. face widths, are employed. The wheels are wood, carrying 31 by 3 3/4 in. cord tires, these tires are mounted on the standard rim, taking the 30 by 3 1/2 or 31 by 4 in. tire. The spare carrier is at the rear of the car in place of on the side.

Steering is by worm and full wheel. The steering gear has been designed particularly for this car and is manufactured in the Hudson plant. It has been greatly simplified by removing the spark and throttle connections from the column and mounting the throttle connection on the dash and incorporating the spark as an automatic advance unit in the ignition itself. The steering wheel is 17 in. wood with aluminum spider.

The steering gear contains its supply of lubricant in an oil tight housing so that once filled with oil it remains self-lubricating for a long space of time. The steering gear is fully adjustable, end play being taken care of by a shim adjustment on the stuffing box. Elongated holes in the steering gear housing permit it to be turned to effect the adjustment.

### Novel Rear Spring Suspension

The spring suspension is semi-elliptic, the front springs being 36 by 2 in. and the rear 55 by 2 in. Adjustable shackles are used throughout to take up any wear on the shackles which may tend to result in rattles. The rear springs are set so that at the rear they are 48 in. apart and at their front ends they are 32 in. apart. The springs are outside of the frame side rails, which are 28 in. apart.

The front springs are mounted directly under the frame side rails and are 26 1/2

in. apart. On the rear springs 28 1/2 in. of their length are ahead of the axle and 24 1/4 in. behind the axle. The frame side rails are parallel, 4 1/2 in. deep, of 1/2 in. stock. The frame has five cross-members.

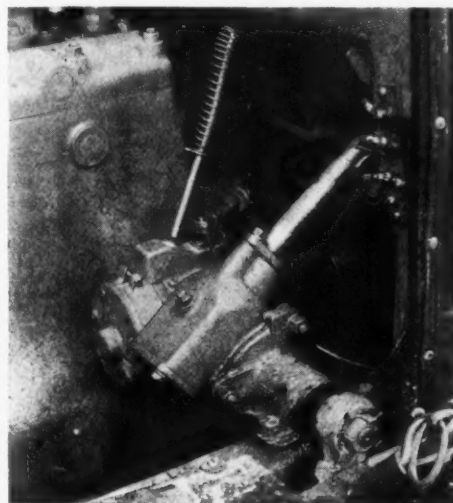
One of the ingenious features of the car is the mounting of the body. The body sill lies outside of the frame and is supported from the frame by six brackets. This is one of the factors which contributes to the lowness of the car. The top of the open car at its highest point is only 5 ft. 10 1/2 in. above the ground, and the front of the top is so low that a man of average height can look directly over it. The space under the rear seat simply acts as rear axle clearance. It does not contain storage space. With the frame side rails only 19 in. above the ground and the body swung outside of the frame in this manner, an attractive low appearance is secured. This is augmented by the small wheel size, the tire size being 31 by 3 1/2 ins.

### Bodies Finished by Baking

The bodies are pressed steel and wood construction, the tendency towards the greater use of pressed steel being continued in these bodies. As compared with the previous Essex bodies, there is about 25 per cent less wood. In the seat supports, and at other points where it is possible, pressed steel has supplanted wood. The finish on the bodies is by a low temperature baking process and the color will be a light blue with red wheels. The top on the open car is collapsible but ordinarily bolts to the windshield with top irons supplied on demand.

### Performance of Car on Road

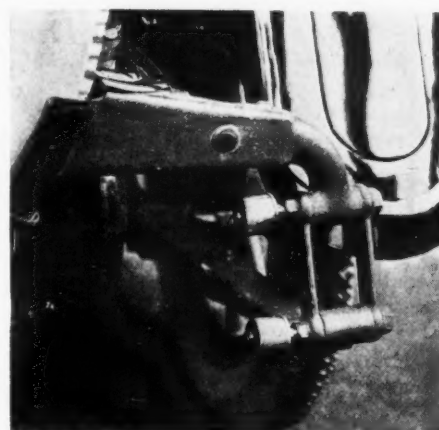
The coach follows along the lines of the previous coaches with improvements. A steel rear panel is now used instead of a soft rear quarter panel. The roof is 2 in. lower in relation to the floor and the seats are 2 in. lower. There is more head room over the driver's seat as the



*The steering gear on the new Essex six has been designed particularly for the car. It is a worm and gear type adjustable in both directions. Note the customary spark and throttle connections have been eliminated*

seat is farther back and consequently under a higher point in the roof than in the previous body. There is 6 1/2 in. more leg room in the rear compartment. The cars are sold with complete equipment including shutters, MotoMeter, neutral lock, rear tire carrier and ventilator.

The Detroit representative of MOTOR AGE drove the new car several miles over the roads about Detroit and found that it is fully in accord with the newest ideas in performance. The car is resilient in action with fine ability to hold the road at even better than the highest touring speeds. The acceleration is sufficient to meet all reasonable demands, averaging 11 to 12 secs. from 5 to 25 miles an hour. The writer took the car over paved and then gravel and dirt roads and found excellent performance on all sorts of surface.



*Owing to the short distance between the side rails of the new Essex frame, the rear spring shackles are supported at the extremities of the rear cross-member as illustrated herewith. The shackles are fitted with spring oilers*

The spread and offset of the rear springs has eliminated all tendency for the car to roll or sidesway. Probably the most noticeable feature in driving the car is the ready response to the steering wheel. The car can be steered without any necessity for "fighting the wheel," on loose gravel at 50 miles an hour. The lowness of the car is also responsible to a large degree for its road feel. The chassis frame is only 19 in. from the ground and the method of mounting the body outside the chassis side rails, as explained, has brought the center of gravity of the loaded car down close to the ground.

### Hand Operated Radiator Shutters

The one-piece windshield affords clear vision and although the windshield is a ventilating type all of the breeze generally necessary for the front compartment on any but the hottest days can be secured through the cowl ventilator. The temperature of the cooling water can be held to any point desired by the hand controlled shutters and a MotoMeter on the radiator indicates to the driver when the shutters need adjustment.



*Wynes and his office—The busy man feels it of prime importance to keep informed on what the other fellow is doing*



*Wynes' place speaks for itself, an invitation that bids you come in*

## Yes, We Have No Association

*But J. A. Wynes Does Not Need One, for He Goes About Charging for What Others Do for Nothing*

By A. H. PACKER

**I**F you do not think he is a progressive chap just drop in and have a talk with him. That's what I did. I went down to Moline, Ill., and found him hard at work, but not so much engrossed in the problem of lead welding that he could not take a broad view of his business and of general conditions in his territory.

If you do not think that J. A. Wynes of Moline, Ill., is a real battery man just take a look at the picture of his service station and then remember that only three and one-half years ago he started with a capital of a few hundred dollars and built the place up with a thousand additional borrowed and a lot of hard work and determination.

When in recent years, the giving of free service to users of storage batteries became more and more of a burden Wynes was only too glad to give serious consideration to the idea of charging for service.

When he undertook, however, to sell the other battery stations both in Moline and the adjacent cities of Rock Island and Davenport, Iowa, on the idea, he was met with a cold reception.

starting and lighting batteries,, and the sign which he placed in his station gave due notice to those seeking his services.

Contrary to the dire predictions of his competitors, his business since August 1 not only has met with no reduction but has continued to increase. Furthermore he finds that most of his customers are relieved to be able to pay a fair charge.

One woman said:

"I formerly hated to come in here. I felt I was taking up your time without being able to compensate for it, and for this reason I often allowed my battery to be neglected. Now I do not mind coming in frequently for I feel I am paying for the service I get."

Only one customer showed signs of antagonism, and when he left the shop with a threat that he would never show up again a feeling of relief was felt not only by the owner but by all of the men as well. This one car owner wanted to know why it was that Wynes should charge for this service while all the other battery men did not and Wynes' only answer was that he only had to pay the rent and take care of the expenses



*The out drive with battery room in the rear*

It took more than a mental dash of ice water however, to stop Wynes when he once saw a course of action based on good business principles. Without worrying about what the other fellow would do, he started on his own account charging 15 cents for testing and filling,



*Skylights in the garage make a quick job of installing that new battery*

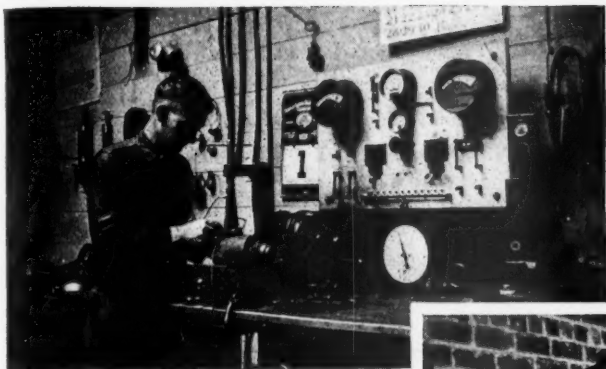


*The record card of each battery is held in a snap clip*

in one establishment and could not therefore have supervision over what the others were doing.

When Wynes first started in Moline he gave up a good position with the Western Electric Company in New York City, because of what his brother told





*Good work, thorough testing and a cash basis are good foundation stones to build on*

him of battery shop conditions in Moline. His first shop was on the side of the railroad track away from the main portion of the town and when Wynes came to figure out why it was that business was slow in coming to his doors he made the discovery that passenger trains or freight trains were blocking the road to his shop about 40 per cent of the time.

Then he began to study traffic conditions in town and found an attractive location on the main highway where nothing but a somewhat decrepit drug store interfered with having a good building put up. That was three years ago and in that time Wynes has been able to purchase and pay for the most up-to-date equipment in addition to paying up on his original loan.

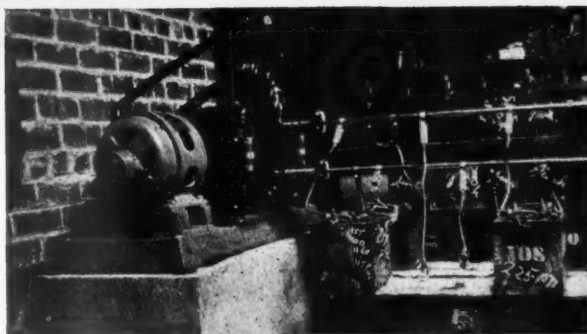
In larger service stations you will probably find no better equipment. The generator and starting motor test stand for example is of the most up-to-date type, while in the same room Wynes has a lathe and a wash rack for generators where gasoline and air under pressure do a cleaning job better than can be done in any other way. Then when the end bracket, or whatever part is being cleaned, has had all of the dirt washed off, the gasoline is shut off and the air only is used for drying purposes.

The garage portion of his building is L shape, providing one door through which cars enter and another through which they leave. On the wall are two or three fire extinguishers. There is also a pair of battery tongs hung on a nail on the wall where the contact man can easily get them. There is then no excuse for wrenching off the cables in such a way as to damage the battery.

A large map of Moline on the wall has over it this sign "Every Dot an Exide" and in the map Wynes has put red headed pins which show the location of the car owners who have purchased batteries from him.

Constant potential charging is the method that Wynes uses to cut down his own stock of rental batteries and give the maximum of efficient service to his customers, and the method he uses of holding the job ticket is one that shows considerable ingenuity. The clamps which hold these cards over the battery to which they refer are merely clothes pins of a type which uses a stiff coil spring, so that the 5 and 10 cent store has contributed its share in the success of this service station.

One of the things that makes it easy to work in this battery station is the liberal use of skylights, there being one in every room, and in the view where a battery



*In an up-to-date service station—constant potential, of course*

case, not there for ornament nor to impress customers but because Wynes has books which he uses and magazines which he reads, while his less progressive fellows are content to spend their time pouring pitch and burning lead.

When Wynes was in the midst of his struggle to see the light financially and at the same time equip his station properly, he sometimes met with protests from his friends who thought he was going a little too far. In one case the purchase of an adding machine for his office at an expense of \$150 seemed to them the last straw, but Wynes looks at it this way, "any one is likely to make mistakes and it is easily possible in a short time to make mistakes which might cost me a great deal more than the price of the machine."

At any rate Wynes has the adding machine, he has a set of books and he keeps the books so that he knows how much he makes on the sale of parts, how much he makes on his labor and just what each department is doing.

Perhaps this story would not be entirely complete without relating an incident

that occurred when a member of the MOTOR AGE staff visited this station. At this time Wynes thought it would be a good idea to get some of the other battery men from Davenport and Rock Island and have a little informal dinner together.

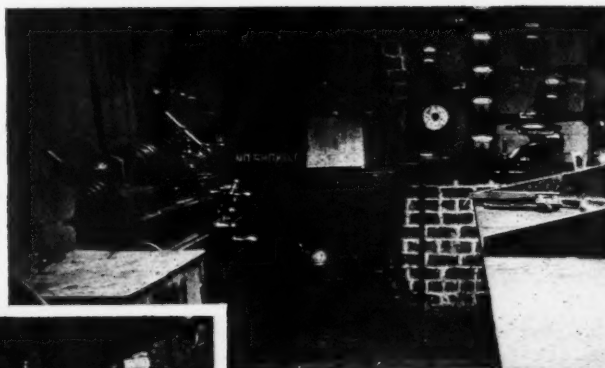
The first man approached on the subject said, "Oh, I'll come if you get everybody else."

Another man said, "Where is the catch Wynes, what are you getting out of it?" After being suspected of having ulterior motives and receiving the cold shoulder at two or three shops Wynes gave up in disgust and decided to give up the association idea as a bad job in his particular town.

In other localities there have been plentiful illustrations of the advantage of cooperation and of associations that work out in common those problems that annoy all dealers. It is however, interesting to see that progressive ideas developed by associations can to a certain extent be used in individual shops even where the association idea falls on barren soil.



*Broadcasting to those who enter, that business is being done in a business-like way*



*The gasoline spray cleaning table is a good place for the "No Smoking" sign*



# Applying the Flat Rate Schedules

*The Wording of a Flat Rate Operation Determines the Exact Amount of Work It Is Intended to Cover. A Knowledge of the Meaning of Flat Rate Words and Terms Is Essential for Intelligent Selling of Flat Rate Repairs*  
*How to Use the Schedules*

By PAUL DUMAS

Preceding articles in this series were published on June 21, July 12, August 23, September 13, October 4, October 25, and November 22, 1923.

**T**HE Flat Rate schedules, as printed in MOTOR AGE each three weeks, are compiled for easy interpretation. There is however, with any arrangement of data, the possibility of inaccurate translation of the information. With this in mind we believe that some specific explanation of the schedules that have gone before will be a useful guide for those who have not followed each installment of the text.

## Nomenclature of Text Accompanying the Schedules

To begin with let us define some of the terms and words used in telling the story of Flat Rate and in the schedules. Let it be understood here that the meaning of these terms, when applied to the Flat Rate articles and schedules, should be taken as we list them below and not by any personal understanding of their application.

**1—Flat Rate Compensation for Mechanics**—A system of paying mechanics' wages. It may be a Bonus or Piece Work plan or a combination of the two.

**2—Flat Rate**—The selling of repairs at a predetermined labor charge. There are three forms of Flat Rate, two of which include the cost of repair parts in the predetermined charge. Flat Rate of the kind that covers labor only is the system most widely used.

**3—Locally Orphan Car**—Any car owned and operated in a territory where it has no sales representation. Thus a Dodge owned and operated in a town where there is no agency is considered a locally orphan car.

**4—Orphan Car**—Any car the makers of which have discontinued its manufacture. This applies to makes and not models.

**5—Independent Maintenance Establishment**—May be a garage, shop, or machine shop. It is considered INDEPENDENT if the establishment is NOT engaged in the sale of new cars. Any organization that sells repairs but not cars.

**6—Official Maintenance Establishment**—Any organization that is officially appointed by the manufacturer to maintain the manufacturer's products. An official maintenance establishment may or may not have the sales agency for the products serviced and maintained.

**7—Maintenance Dealer**—A general term used to cover No. 5 and 6.

## These Definitions Apply to the Word- ing Used in the Schedules

**Remove and Install**—This covers only the removal and installation of the unit

or part to which it is applied. It does NOT include STRIPPING the unit of brackets, sub-assemblies, hangers, bolts, etc., except those which must be removed to withdraw the unit or part.

"Remove and install axle," means that the axle is unbolted from the springs and the drag link disconnected. It may include the wheels and front splash pan, etc., but the knuckles, bolts, and bearings for wheels are not touched unless specified.

An example of a case where "remove and install" operation is utilized would be the removal of the engine flywheel. To get at the flywheel it probably would be necessary to remove the clutch and transmission assembly. No work is done on these assemblies except to remove and install.

**Overhaul**—This covers the operations of removal and installation in addition to the actual overhauling. Where OVERHAUL is not intended to cover removal and installation it is specified in the wording of the operation.

**Remove**—The word is self explanatory. It does not include INSTALLING. In some cases such as REMOVE RATTLE FROM STEERING COLUMN the word is intended to include all the work necessary to eliminate the rattle. Thus applied it may include the removal and installation of certain parts or units which are sometimes specified in the wording of the operation or its procedure.

**Install**—Unless otherwise specified INSTALL includes both removal and installation of the parts necessary to complete the job covered. An example of the use of this word can be seen in operation No. H22 covering the clutch on Hupmobile, Oct. 4th issue, as worded. "INSTALL CLUTCH PLATE ANTI-RATTLER SPRINGS. To complete see operations H35 and H36." No. 35 and 36, which cover removal and installation of the clutch assembly, are added to the time for H22 if the springs are installed as a single or only operation on the clutch.

**Renew**—This word is used to cover operations that require the REMOVAL, STRIPPING AND INSTALLATION of all parts fastened to the piece or unit. It does not include OVERHAUL but is used in the schedule only where the part renewed is to be replaced with a new one. Example: RENEW FRONT AXLE I BEAM OR CENTER. This means that the axle center piece is STRIPPED of the knuckles, bolts, cross rods, wheels, shock absorber fastenings, etc. The

parts stripped are installed on the new axle center and the assembly installed.

**Remove and Install for Overhaul**—This covers the removal, disassembly, inspection, and installation of the part or unit. If the worn parts can be replaced with new ones in the same time that would be required for the putting back of the old ones no extra charge is made. In other words installation of new parts is included if they can be put in as quickly as the original parts.

This term can be considered as covering the replacing of parts that do not require accurate hand fitting.

**Remove for Inspection**—This operation covers the removal and enough of the disassembly to enable the workman to locate the cause of an engine knock or a noise in the transmission or rear axle. Can be used for any unit that has a multiplicity of parts not easily accessible.

This form of operation is absolutely necessary for the successful working of a Flat Rate system. Among other things it enables a very accurate estimate of the repair parts required which of course permits quoting a Flat TOTAL PRICE.

When the words "Remove for inspection" are used at the head of a flat rate schedule it is customary to indicate or describe the work included in the inspection of the unit.

## How and When It Is Used

All "Remove for inspection" operations are compiled for one big reason and that is to eliminate guesswork.

The cleverest diagnostician of automobile ailments cannot tell by the sound of a knocking engine whether the crankshaft is scored or eccentric, unless he actually inspects the shaft. Neither can he tell the AMOUNT which spells the difference between a new shaft or a shaft that could be reground.

It is one thing to diagnose and name the part that causes abnormal noise but it is entirely a different proposition to attempt to prophesy the CONDITION of that part without inspecting it. Any attempt at such a thing is out and out clairvoyance. A noisy engine may have several parts dangerously loose but not all of them will manifest themselves to the ear of the troubleshooter.

## How to Proceed

There are two lines of procedure to follow when selling Flat Rate operations to cover a noisy engine or equivalent unit.

(Continued on page 20)

## Flat Rate Schedules—Chassis—Front Axle and Steering Gear

The operation of "straightening front axle" is not listed. This omission is made because in the majority of cases it is a time job. It is not advisable to straighten a front axle by heating unless it is reheated before installation. Cold straightening is safe for bends of small magnitude.

DODGE—All Models			
Operation No. 200	OVERHAUL FRONT AXLE. Includes STEERING KNUCKLE REBUSHING but no work is done on drag link or steering connecting rod. MATERIAL	5 hrs.	
THIS OPERATION INCLUDES ADJUSTMENT AND ALIGNMENT OF WHEELS AND AXLE.			
Operation No. 201	REMOVE and INSTALL front axle CENTER ONLY. MATERIAL	3 1/2 hrs.	
Operation No. 202	REMOVE and INSTALL ONE STEERING KNUCKLE. MATERIAL	1 1/2 hrs.	
Operation No. 203	REMOVE and INSTALL ALL STEERING KNUCKLE BOLTS AND BUSHINGS AND TIE ROD BOLTS AND BUSHINGS. Includes adjustment and alignment of wheels. MATERIAL	4 hrs.	
Operation No. 204	OVERHAUL STEERING GEAR LOWER HALF—SECTOR TYPE. MATERIAL	7 hrs. 5 hrs.	
PROCEDURE ON THIS OPERATION REQUIRES: type and removal of carburetor on sector type. REMOVE STEERING GEAR ASSEMBLY LOWER HALF SECTOR TYPE AND INSTALL STEERING GEAR ASSEMBLY LOWER HALF WORM TYPE. MATERIAL			
Operation No. 206	REMOVE and INSTALL ONE STEERING GEAR BALL ARM. MATERIAL	8 1/2 hrs.	
Operation No. 207	ADJUST STEERING GEAR ASSEMBLY LOWER HALF. Includes tightening steering gear ball arm. MATERIAL	1 hr.	
Operation No. 208	OVERHAUL STEERING GEAR UPPER HALF ASSEMBLY ONLY. Includes rebushing column and column sector, sharpen teeth on hand levers and true up steering columns. MATERIAL	1 hr.	
Operation No. 209	REMOVE and INSTALL STEERING WHEEL. MATERIAL	3 hrs.	
LINCOLN			
Operation No. 200	REMOVE AND INSTALL ONLY, STEERING GEAR.	7 1/2 hrs.	
Operation No. 207	ADJUST STEERING GEAR. Includes same work as Maxwell operation.	1 1/4 hrs.	
Operation No. 209	REMOVE AND INSTALL STEERING WHEEL.	1/2 hr.	
MAXWELL—Beginning With Car No. 193801			
Operation No. 201	REMOVE AND INSTALL FRONT AXLE CENTER. Includes removal and installation of wheels, steering knuckles, steering arms and cross rod. WHEN KNUCKLE PINS ARE FREE. MATERIAL	4 hrs.	
None. WHEN KNUCKLE PINS ARE FROZEN CHARGE EXTRA TIME FOR FREEING SAME.			
Operation No. 200M	REMOVE AND INSTALL BUSHINGS IN ENDS OF AXLE CENTER—One side of steering knuckle. Includes removal and installation of wheels, steering knuckles and pins. New pin installed if necessary. MATERIAL	2 hrs.	
(A) When steering knuckle pin is frozen charge extra time for freeing same.			
(B) REMOVE AND INSTALL STEERING ARM BUSHINGS in conjunction with No. 200M. Add each REMOVE AND INSTALL ONE STEERING KNUCKLE. Includes installing new pin if necessary. MATERIAL			
Operation No. 202	REMOVE and INSTALL ALL STEERING KNUCKLE, AXLE CENTER AND STEERING ARM BUSHINGS. MATERIAL	5 1/2 hrs.	
Operation No. 203	REMOVE and INSTALL STEERING GEAR BALL ARM. MATERIAL	4 hrs.	
Operation No. 204	REMOVE, OVERHAUL COMPLETELY AND INSTALL STEERING GEAR ASSEMBLY. Does not include work on spark or gas sector levers. MATERIAL	1 1/2 hrs.	
Operation No. 206	REMOVE and INSTALL STEERING GEAR BALL ARM. MATERIAL	3/4 hr.	
Operation No. 207	(A) INSTALL NEW DRAG LINK in conjunction with No. 206, add ADJUST AND TAKE PLAY OUT OF STEERING SYSTEM by the following: Adjust eccentric bushing, tighten cross rod bolt, tighten drag link both ends, tighten fulcrum bolt, tighten worm adjusting nut, tighten arm on gear shaft. MATERIAL	1/2 hr.	
Operation No. 207F	None. STEERING BY REVERSE OF ABOVE OPERATIONS. MATERIAL	1 hr.	
Operation No. 208M	REMOVE AND INSTALL STEERING WHEEL SHAFT BUSHING AT TOP OF COLUMN, including removal of steering wheel and shaft. MATERIAL	1 1/4 hrs.	
Operation No. 209	REMOVE AND INSTALL STEERING WHEEL, including removal of horn button. MATERIAL	1/2 hr.	
Operation No. 210	ADJUST CROSS ROD TO ALIGN WHEELS. MATERIAL	1/2 hr.	
None.			

# OVERLAND AND WILLYS KNIGHT—Models 91, 92RE, 1A, 4, 64, 67, 20A, 20, 75, 90, 85-4, 85-6, 89-6, 88-4

Operation No. 200 OVERHAUL FRONT AXLE ASSEMBLY. Includes same work as Dodge and Maxwell. Does not include straightening.

Operation No. 201 MATERIAL. Models 64, 67, 20, 20A Same as Dodge. INSTALL FRONT AXLE CENTER. MATERIAL

Operation No. 202 REMOVE AND INSTALL ONE STEERING KNUCKLE. Models 64, 67, 20, 20A

Operation No. 203 REMOVE AND INSTALL ALL STEERING KNUCKLE BOLTS AND BUSHINGS AND CROSS ROD BOLTS AND BUSHINGS.

Operation No. 204 OVERHAUL STEERING GEAR ASSEMBLY COMPLETE. Includes same as Dodge and Maxwell.

Operation No. 206 MATERIAL. Models 64, 67, 88-4, 20A, 20 Models 75, 90, 85-4, 85-6, 88-4 Others REMOVE AND INSTALL STEERING GEAR BALL ARM.

Operation No. 207 TAKE PLAY OUT OF STEERING GEAR BY ADJUSTING. Models 64, 67, 20, 20A Maxwell. Includes same work as Models 64, 67, 20, 20A REMOVE AND INSTALL STEERING COLUMN BUSHING.

Operation No. 208 REMOVE AND INSTALL STEERING WHEEL SPIDER. Models 75, 90 MATERIAL

Operation No. 209 TAKE SHIMMY OUT OF WHEELS AND TIGHTEN ALL STEERING CONNECTIONS. Models 64, 67, 20A, 20

REO—Models T6 and F TAKE RATTLE OUT OF COLUMN AT UPPER END MODEL T6 ONLY.

Operation No. 206 REMOVE AND INSTALL STEERING GEAR BALL ARM. Bushing, tube, etc. MATERIAL

Operation No. 204R REBUSH SECTOR SHAFT. Ball arm. MATERIAL

Operation No. 209 REMOVE AND INSTALL STEERING WHEEL. Bushing. MATERIAL

## OAKLAND—Models 6-34B, C, D and 6-44

Operation No. 202B REMOVE AND REBUSH BOTH STEERING KNUCKLES AND KNUCKLE ARMS AND REPLACE.

Operation No. 210 ADJUST CROSS ROD TO ALIGN WHEELS. Bushings, pins and bolts. MATERIAL

# FORD—Model T—FORDSON TRACTOR

Operation No. 200 OVERHAUL FRONT AXLE ASSEMBLY. Includes cross rod and drag link and bushings. MATERIAL FORDSON

Operation No. 200T TIGHTEN ONLY FRONT END ASSEMBLY. Includes tightening front end of radius rods. FORDSON

Operation No. 202 REMOVE AND INSTALL ONE STEERING KNUCKLE. MATERIAL FORDSON

Operation No. 203 REMOVE AND INSTALL ALL STEERING KNUCKLE BOLTS AND BUSHINGS ARM BOLTS AND BUSHINGS AND ALIGN WHEELS. MATERIAL FORDSON

Operation No. 204 REMOVE OVERHAUL AND INSTALL STEERING GEAR. Includes same labor as Maxwell operation No. 204. MATERIAL Model T only

Operation No. 208F REMOVE AND INSTALL STEERING SHAFT LOWER BRACKET BUSHING. Same as Dodge. MATERIAL

Operation No. 201 REMOVE AND INSTALL FRONT AXLE CENTER. Includes same labor as Dodge. MATERIAL FORDSON

## PAIGE 8-68 AND JEWETT

Operation No. 201F REMOVE AND INSTALL FRONT AXLE ASSEMBLY. MATERIAL

Operation No. 202 REMOVE AND INSTALL ONE STEERING KNUCKLE. Includes same as Dodge or Maxwell. MATERIAL

Operation No. 203 REMOVE AND INSTALL ALL STEERING KNUCKLE BOLTS AND BUSHINGS AND TIE ROD BOLTS AND BUSHINGS. Includes adjustment and alignment of wheels. MATERIAL

Operation No. 206 REMOVE AND INSTALL STEERING BALL ARM. Same as Dodge. MATERIAL

Operation No. 207 REMOVE AND TAKE PLAY OUT OF STEERING SYSTEM. Includes same work as Dodge or Maxwell. MATERIAL

Operation No. 210 ADJUST CROSS ROD TO ALIGN FRONT WHEELS. None. MATERIAL

Operation No. 209 REMOVE AND INSTALL STEERING WHEEL. None. MATERIAL

Operation No. 204PJ OVERHAUL STEERING ASSEMBLY. Includes: Same work as Hudson operation No. 204H. MATERIAL Same as Dodge.

## MARMON—Models 34 and Later

Operation No. 212 ALIGN FRONT WHEELS AND ADJUST BEARINGS. 2 hrs.

Operation No. 213 REBUSH STEERING CROSS RODS. 3 hrs.



## HUDSON SUPERSIX AND ESSEX

Operation No. 200	OVERHAUL FRONT AXLE ASSEMBLY. Includes same work as Dodge plus painting axle. Same as Dodge. MATERIAL.	7 hrs.
Operation No. 202	REMOVE AND INSTALL ONE STEERING KNUCKLE. Same as Dodge. MATERIAL.	1½ hrs.
Operation No. 203	REBUSH FRONT AXLE. Includes: Re-bushing tighten spring "U" bolts, renewing spindles and thrust if necessary, inspect, clean and repack front wheels bearings replacing if necessary. Align wheels. MATERIAL.	3½ hrs.
Operation No. 204H	OVERHAUL STEERING ASSEMBLY. Includes: Everything from steering wheel to and including cross rod, renew or repair any or all parts necessary and grease. Align wheels. MATERIAL.	7 hrs.
Operation No. 207	ADJUST WORM AND WHEEL AND DRAG LINK. Includes: Same work as Dodge. MATERIAL.	1 hr.
Operation No. 208	REMOVE AND INSTALL BUSHING IN TOP OF STEERING POST. Includes same work as Maxwell. MATERIAL.	1½ hrs.
Operation No. 209	RENEW STEERING WHEEL. Includes: Renew steering wheel and parts necessary. MATERIAL.	1½ hrs.
Operation No. 210	ALIGN FRONT WHEELS. Includes: Same work as on Maxwell. MATERIAL.	½ hr.

## CADILLAC—Eight Cylinder Models

Operation No. 210	LINE UP FRONT WHEELS TO TOE ¼-½ inch.	\$0.75
Operation No. 207	ADJUST STEERING GEAR AND CONNECTIONS.	2.60

## STUDEBAKER—Models Big, Special, and Light Six

Operation No. 203	REMOVE AND INSTALL ALL STEERING KNUCKLE BOLTS AND BUSHINGS, ARM AND CROSS ROD BOLTS AND BUSHINGS. All models up to 1921 MATERIAL. All models after 1921 Same as Dodge.	7½ hrs. 7 hrs.
Operation No. 204	REMOVE, OVERHAUL COMPLETELY AND INSTALL STEERING GEAR ASSEMBLY. Does not include any work on drag link or cross rod. MATERIAL.	10 hrs.
Operation No. 207	ADJUST AND TAKE PLAY OUT OF STEERING SYSTEM. Includes same work as Maxwell operation No. 207.	1 hr.
Operation No. 207F	FREE STEERING BY REVERSE OF ABOVE OPERATIONS. Includes removal if necessary of knuckle bolts.	3 hrs.
Operation No. 209	REMOVE AND INSTALL STEERING WHEEL.	1½ hrs.

## BUICK—Models H to 22 Inclusive

Operation No. 200	OVERHAUL COMPLETE FRONT SYSTEM. Does not include steering gear column proper. All bolts, pins and bushings are replaced where necessary. MATERIAL.	15 hrs.
Operation No. 201	REMOVE AND INSTALL FRONT AXLE-CENTER. Includes painting I beam and tighten Pitman arm and drag link. MATERIAL.	5½ hrs.
Operation No. 202	REMOVE, REBUSH, FIT KING BOLT, REPLACE AND TRAM WHEELS ON STEERING KNUCKLE. ONE TWO MATERIAL.	3½ hrs. 4½ hrs.
Operation No. 203.	REBUSH COMPLETE FRONT SYSTEM. Includes all of front system except steering gear proper. MATERIAL.	11 hrs.
Operation No. 204	OVERHAUL STEERING GEAR ASSEMBLY. Includes drag link and connecting rod and king bolts. MATERIAL.	6 hrs.
Operation No. 206	REMOVE AND INSTALL STEERING GEAR BALL ARM. Same as Dodge. MATERIAL.	1½ hrs.
Operation No. 207	ADJUST STEERING GEAR. Includes adjustment of steering gear post only and does not include work on cross rod or drag link. MATERIAL.	¼ hr.
Operation No. 207F	FREE STEERING. Includes adjustment of gear and adjusting of cross rod and drag link. MATERIAL.	1 hr.
Operation No. 209	REMOVE AND INSTALL STEERING WHEEL. Requires removal of hand controls. MATERIAL.	1½ hrs.
Operation No. 210	ADJUST CROSS ROD TO ALIGN WHEELS. Includes truing rims. MATERIAL.	1 hr.

## PACKARD—Single Six Models 126, 133 and 116

Operation No. 201	REMOVE AND INSTALL FRONT AXLE ONLY.	4½ hrs.
Operation No. 202	REMOVE AND INSTALL ONE STEERING KNUCKLE. MATERIAL.	5 hrs.
Operation No. 203	REMOVE AND INSTALL ALL KNUCKLE AND CROSS ROD PINS AND BUSHINGS.	9 hrs.
Operation No. 201P	INSTALL NEW FRONT AXLE. Includes stripping old axle.	12 hrs.
Operation No. 211	TIGHTEN ALL STEERING CONNECTIONS.	1½ hrs.
Operation No. 215	REMOVE, DISASSEMBLE, INSPECT AND REPLACE STEERING GEAR ASSEMBLY.	7 hrs.
Operation No. 216	INSTALL NEW STEERING YOKE ROLLERS AND PINS AFTER STEERING GEAR HAS BEEN REMOVED. To complete add operation "217." Complete Total	6 hrs. 10 hrs.
Operation No. 217	INSTALL ONLY STEERING GEAR.	4 hrs.
Operation No. 210	ADJUST CROSS ROD TO ALIGN WHEELS.	1 hr.
Operation No. 218	REMOVE AND INSTALL BOTH FRONT WHEELS.	2 hrs.
Operation No. 209	REMOVE AND INSTALL STEERING WHEEL.	1 hr.

(Continued from page 16)

One is to sell the complete overhaul operation and the other is to sell an inspection operation. The latter will determine the amount of work necessary to properly repair after which this work is listed according to schedules covering it and sold as definite operations. Good mechanical judgment and a sense of fairness are all that is necessary to determine the proper operation.

There are cases where the cost of an overhaul operation on certain units is so low that it is advisable to sell the overhaul job without troubling to tear down and inspect. The average clutch, steering gear, and the rear universal joints are examples. A clutch which continues to slip, after being treated and inspected externally for faults, should be given the overhaul operation rather than tear down and inspect. The times for the two jobs will show little difference unless the clutch is of unusual construction.

It will be found in the schedules printed in MOTOR AGE that on some cars, some of the units are not covered by an "Inspection" operation. Such parts or units, if they do not yield to the usual minor repair operations listed for them, should be handled by selling the overhaul operation direct.

#### Units That Usually Require Inspection

A good general rule to follow is that on all major units, such as ENGINE, TRANSMISSION, TORQUE TUBE, AND REAR AXLE, sell an "Inspection operation, if the exact magnitude of the repairs is not known.

These inspection operations should be executed as quickly as possible after the repair order has been signed. The findings of the workman's inspection should be reported to the boss who immediately communicates with the car owner. In the meantime the Flat Rate operations necessary to put the unit in shape are listed and totaled and then the owner is told the labor charge for the complete job.

If approved, the figures submitted to the owner must be based on operations that cover "repair" or "overhaul when part or unit is down". In other words, if it is found that a complete overhaul is necessary the labor charge against the owner for the Inspection operation is canceled and the charge for overhaul only is made.

#### Owner Rejects

Should the owner disapprove of the amount of work suggested and requests that the job be reassembled as is, the procedure is as follows: Charge for the operation executed. This brings us to the difference between "REMOVE, INSPECT AND INSTALL" and REMOVE FOR INSPECTION. The former covers the entire amount of work necessary, the latter covers only the removal and inspection. In case of disapproval then, be sure that the operation sold covers the REINSTALLATION of the inspected units or parts.

#### Selling a Group of Operations

A fair knowledge of the car and a

thorough grasp of the meaning of what is printed in the flat rate schedules is required for intelligent selling of a group of repair jobs.

There is always the chance of overlapping operations or of not fully covering the work with the proper number of operations. Here is a typical example: It has been determined that a certain engine requires the following work to put in good shape: SET OF PISTON RINGS, ONE NEW LOWER ROD BEARING, 2 NEW PISTONS AND PINS, ADJUST OTHER ROD BEARINGS AND TIGHTEN ALL MAIN BEARINGS.

Taking the operations from the schedules printed in past issues of MOTOR AGE the repair order for the Maxwell would be written like this:

Operation No. 1—Install complete set piston rings.....	5	hrs.
Two of Operation No. 1B—Install new piston in conjunction Operation No. 1. ADD each ½ hr.....	1	hr.
Two of Operation No. 1B—Install piston pin in conjunction Operation No. 1. ADD each ½ hr.....	1	hr.
3HO—Grind valves, clean carbon, etc., when head is off.....	3 ¾	hrs.
7D—Remove, scrape and install one lower rod bearing when head and pan are removed.....	1 ½	hrs.
9D—Tighten all main bearings when pan and head are removed .....	3 ¾	hrs.
	15 ¾	hrs.

#### Different Operations

A close observer of the schedules that have been printed will note that for the same unit, different jobs are listed, according to the make of car. This is done to cover the differences in construction of the various makes. For instance only two operations are given covering the clutch of a certain make car while a different make will have as many as ten operations covering the same unit.

In case you are working on a car not listed in the schedules and want to sell a job listed in the schedules for another make, proceed as follows: Examine the schedules and find the operation that describes the work you propose to do. The operation you are looking for may be listed under several car makes. Select the operation from the car that most nearly resembles the construction of the car you intend to repair. If possible select a car that is also in the same price class. Apply the time limit listed and use it as your flat rate for the car listed in the MOTOR AGE schedules.

THE OPERATIONS ON THE MAKES OF CARS COVERED BY THE MOTOR AGE SCHEDULES CAN BE APPLIED TO ANY OF THE OTHER MAKES IF THEY ARE OF CONVENTIONAL CONSTRUCTION.

Next installment: TOLERANCES AND THEIR RELATION TO FLAT RATE.

## 23 Years Ago This Week In Motor Age

(From MOTOR AGE of Dec. 13, 1900.)

#### Space for Chicago Show

On Saturday of this week the management of MOTOR AGE will make the first allotment of spaces for the automobile show at the Coliseum, Chicago, March 23-30. The applications received up to Tuesday cover considerably more than one-half of the building and include the following makers:

Badger Brass Co., Kenosha, Wis.  
Baldwin Auto Mfg. Co., Connellsville, Pa.  
Borbein, H. F., & Co., St. Louis.  
Century Motor Vehicle Co., Syracuse.  
Eastman Automobile Co., Cleveland.  
Grant Bros., Orange, Mass.  
Gray & Davis, Amesbury, Mass.  
Haynes-Apperson Co., Kokomo, Ind.  
Milwaukee Automobile Co., Milwaukee.  
Moffett Vehicle Bearing Co., Chicago.  
Muller, H. C., Milwaukee.  
Munger Vehicle Tire Co., New Brunswick, N. J.  
National Auto & Electric Co., Indianapolis.  
Olds Motor Works, Detroit.  
Overman Automobile Co., Chicopee, Mass.  
Remington Automobile Motor Co., Ilion, N. Y.  
Scott & Cooner Mfg. Co., St. Louis.  
Temple, Ralph, Chicago.  
Thomas Motor Co., Buffalo.  
Waltham Mfg. Co., Waltham, Mass.  
Winton Motor Carriage Co., Cleveland.

#### Horse Owners Object

CLEVELAND, Dec. 10.—Horse owners in this city are endeavoring to place restrictions upon the use of steam vehicles on the city streets. While it is admitted that automobiles in general have equal rights with other vehicles, it is claimed that the clouds of exhaust steam arising from steam vehicles, especially on cold days, make the machines a source of great danger to those who drive horses. Several accidents have recently arisen from this cause.

#### A Big Merger

NEW YORK, Dec. 8.—Thursday saw the consummation of another gigantic stride in the extension of the Electric Vehicle Co.'s holdings of electric automobile stock through an election of new officers marking its purchase and entire control of the Riker Motor Vehicle Co. of Elizabethport, N. J. Rumors of a gigantic electric vehicle trust have followed, which have mentioned as possible members of the great combination about all of the automobile companies using electricity as a motive power.

#### For the Mexican Roads

The St. Louis Automobile Supply Co. have lately sold a gasoline trap to go to central Mexico. It is designed to make a 150-mile run, climb all grades and average 14 to 15 miles per hour. It will be shod with steel tires. The vehicle is just finished and has been thoroughly tested and will come above the specifications.



# When and How Shall You Sell Your Used Cars; What Holding Them Over Means

*Should You Make Money on Your Used Cars and If Not, Why? Is It the Other Fellow Who Is Throwing the Wrench Into the Machinery?*

By C. F. HEEMER

Auditor and Statistician of the Washington, D. C., Automotive Dealers Association

## PART II

IT IS astounding to realize that with all the ideas which have been advanced for the partial relief and solution of the used car problem, the situation today remains practically the same, except for a strong probability that it will become much worse in the very near future. Is it possible with all the thought and effort put forth on this problem that it is beyond the reach of the dealers?

Various reasons have been given why it cannot be brought under control. Many of these reasons are undeniable, but the fundamental reason back of it all, it appears to me, is the lack of a complete understanding of the problem by a sufficient number of the dealers in each community to enable them to entertain a uniformity of ideas.

### Which Dealers Problem Is It?

The answer so often given by dealers is, "personally, we have solved our own problem and don't need a used car plan." If any dealer will try to look ahead for one year, I am sure, he will find, regardless of his present situation, that he has a vast personal interest in having a used car plan, whereby all dealers would buy their used cars under market price, carried out to its fullest intentions and purposes. If a dealer is making money on his used cars now he needs it to enable him to continue making money on them and if he is losing money on them, he needs it to enable him to eliminate this loss.

It is every dealer's problem and every dealer should give his association his earnest cooperation and support. A dealer may be sitting on top of the ladder today, but he has no assurance whatever that he will be next year, unless such a plan is carried out. The plan whereby all dealers buy their used cars 25 per cent under current sales market, carried out with the full and honest cooperation of all dealers, will lend a great measure of assurance and safety to all.

Collective participation and the promotion of the right ideas, founded upon facts which are attainable only through the association, will make such a plan work to ultimate success.

### Erroneous Viewpoints

There are yet a large number of dealers who work under the misconception of unprofitable ideas. One dealer will entertain one idea which is losing him

We are presuming that you read the first section of this article on used cars, which was printed in MOTOR AGE of Nov. 15. To fully understand this article it is necessary that you have read the first part of it.

Mr. Heemer is apparently seeking a solution of the problem, rather than presenting one. He asks that the Dealer Associations join in the solution. His article was written without consideration of the N. A. D. A. plan or the Appleby plan, both of which seek to establish an overhead system to keep the used car market in some state of organization. Perhaps these plans may supply the one thing that is missing in Mr. Heemer's article.

money and another will entertain another. Every dealer has a right to his own opinion, but where such opinions are based upon assumption or intuition and not upon facts, they are not worth much to him and are often very detrimental to the trade in general.

### "We Don't Have to Make a Profit on Our Used Cars"

There are a lot of dealers who will say that they don't have to make a profit on their used cars. How can the average dealer, handling the average car, make money in the automobile business when he is losing money on his used cars?

The discount on most cars is not over 25 per cent. The selling expense, i. e., advertising, commissions, demonstration expense, work on new cars, guaranteed service, insurance and storage on his new cars takes at least 10 per cent of his discount. This expense reaches 15 per cent with many dealers. This leaves from 20 per cent to 15 per cent profit on new cars to cover all overhead and carrying charges. Very few dealers are operating their businesses for less than 18 per cent of the total sales in all departments, including used cars.

Very few dealers make a net profit on their service departments and the profits on parts and accessories are usually small. At least 90 per cent of new car sales entail trade-ins of used cars. Many dealers handle a greater number of used cars than new, due to re-possession and trade-ins on used car sales.

The net profit which the visionary

dealer talks about is scarcely ever found to exist when inventories are taken and an accounting is made. There are too many dealers using the guessing system instead of an accounting system.

### "We Can Sell Our Used Cars Next Spring and Make Money on Them!"

A number of dealers entertain the idea that they can hold used cars over from fall of the year and sell them in the spring and make a profit by so doing. It is true that used cars move much faster in the spring than in the fall, but they do not bring more money than the values according to the fall listings.

It costs the average dealer at least \$50.00 to carry a used car over from December to April. This cost, however, is very necessary, due to the nature of the business, but it should be taken into consideration when making allowances on used cars between October and March.

The tire and battery deterioration is another matter which must be considered. Cars left sitting in warehouses for three or four months usually require new tires soon after they have been put on the streets. While the dealer rarely sustains this cost, it is a source of great dissatisfaction to the buyer and is also often the cause for slow payments on the deferred balance owing on such cars.

### "The Used Car Department Should Not Be Charged With Selling or Overhead Expense"

Some dealers contend that new cars should stand all the expense occasioned by virtue of handling used cars for the reason that the used car is taken in on the sale of the new car. Dealers have got to come to the realization that they are in the automobile business and that the used car is just as much a part of their business as the new car.

Dealers who are getting departmental costs find that the profits on new cars will not carry all the expenses of the business, exclusive of the parts and service departments. The used car department should be charged with all repairs on used cars, advertising used cars, gas and oil used in demonstrating, washing and polishing, rent for space used, salary of used car manager or appraiser, commissions and miscellaneous expense of this department.

Some dealers are now making a profit on their used car departments after all this expense has been charged. Experi-



ence has shown that the used car department, under no circumstances, can be allowed to be a drag on the new car department with any dealer if his total business is going to be profitable.

**"We Will Put Our Cars Out This Year and Next Year We Will Make the Money"**

The entertainment of this idea has put more dealers out of business and given more cars a black name than any other. While dealers, as a rule, seem to think that the only thing that is necessary is to get their cars on the street, it has been proven in many cases that new cars put out at the expense of long trades is equally detrimental to the dealer and factory alike.

If a car is good value for the price, its success in being marketed year after year depends upon the amount of good business salesmanship effort put forth. Trick methods, either in the form of long allowances, factory trading allowances or factory trading bonuses, will soon be found out by the public and the course of its success gained in this way will soon be run.

The losses brought about on the overvalued used cars and lack of sales after the public becomes acquainted with such methods are not compensated for by the short period of apparent success gained in this way. Safe and sane methods and a lot of hard work will always produce far better results. This is true with the car that is being introduced as well as with new models of older makes.

**"It's the Banker's Problem"**

No small number of dealers will tell you that it is the banker who will, or who must settle the used car problem.

It appears to the writer that if you dealers are going to wait for the banker to settle it, many of you will not save your suit and many others will be lucky if they come out with a clean shirt.

While bankers are going to use diligent care, they are not going any farther than is necessary to protect themselves, especially not before disaster occurs. They are not going to protect your profits or your investment. There is no likelihood whatever of any action being taken by bankers which will solve the used car problem from the standpoint of the dealer. The bankers will curtail loans on unsecured lines of credits where the net worth of firms does not justify them, but this action on their part will be entirely too slow to materially benefit the used car situation.

If dealers do not take the matter in hand collectively and work out their own salvation, only the stronger ones will weather the approaching storm and the difficulties which these will encounter will be plenty after a few of the weaker ones go by the board.

**"Dealers Will Soon stop Taking the Used Cars In"**

Other dealers will tell us that the dealers will soon stop taking the used cars in as part of the purchase price on

new cars and that the owners will have to dispose of them elsewhere.

This, likewise, is not going to come about for a number of years, if at all, and the dealer cannot look forward to any relief from this source.

All such ideas as the foregoing are untimely and detrimental. The used car will be handled by the new car dealer for a number of years to come and the sooner the dealers accept the proposition as it is today and make plans to meet the requirements of the trade, the better they will fare. The used cars will always be saleable at the right price and the real issue is in buying them at the right price and nothing else.

This problem belongs to the dealers and to no one else and they must settle it for themselves.

**"That Other Dealer"**

In answer to inquiries regarding the used car plan, dealers will so often tell us that the other fellow is throwing the monkey wrench in the machinery. This may be true, but we should remember that none of us are perfect.

Various conditions were mentioned in Part 1 of this article for which the dealers are not always personally responsible. All dealers should remember that it is the purpose of the association to help such dealers out of bad situations by its influence and to get the unruly dealer in line. No man will intentionally do a thing to his own detriment. If he does it is because he has a mistaken vision. The association can lend its efforts to good advantage in the way of helping to bring about a common understanding by all dealers.

Owing to the variance in the conditions in which different dealers are situated, it is absolutely necessary to make certain allowances in order to get the best cooperation. The imaginary conditions and the lack of coordination in arriving at a common understanding are much greater handicaps to success of the used car plan than the actual infractions.

**"A Method Only Partially Successful"**

The following method is being used to some extent with fairly successful results:

The dealer, upon being unable to agree with his customer on a price for the used car, takes it in at a reasonable low figure which is guaranteed to the customer, conditional upon paying the customer all over such guaranteed amount, less the cost of repairs, that the car is sold for. Usually, all bids are submitted for a period of thirty days, at the end of which time if the car is not sold, the matter, between the customer and dealer, is ended.

In the case of the higher priced cars, this is thought to be a very practical way of meeting competition without unreasonable risk. In most instances, however, no provision is made for selling or handling expense. In view of the fact that it costs at least 15 per cent to handle used cars, this charge should be

made for disposing of the car.

It appears that it should be an easy matter for all dealers to agree on a handling charge of 15 per cent to be made by all dealers where cars are taken on the guaranteed price basis. This method could be worked out by certain classes of dealers so that it would not be necessary to sustain an actual loss on handling the cars. This would require, however, an agreement on the amount to be guaranteed and also an agreement on the handling charge and for this reason it is an indirect way of obtaining satisfactory results.

The method of buying 25 per cent under market is more direct and is straight forward business. The dealer can move the car at will and it has every advantage that the guarantee method has when fully analyzed.

**Attacking the Used Car Problem Nationally**

We hear a good many dealers say that the problem should be attacked nationally. There is no doubt about this, it should be, but just what course of procedure will assure success. It is a very big undertaking. The same difficulties will be encountered in a national plan that are encountered in a local plan.

The necessary requisites to a national plan or a national attack are the same as for the local attack, the principal one of which is gaining of a common understanding. The next is the basis of buying. While a national plan would require a central bureau, the heads of such bureau would not be able to lay down a general set of effective rules immediately which all dealers would abide by.

It appears to me that the most practical procedure for attacking the used car problem in a national manner would begin within the respective local associations. After a number of these have formulated and agreed on a general policy, and have machinery in operation for collecting and dispensing information, it should be practical to organize a national bureau with these associations as members. In this way, the national bureau would be able to show the practical workings from the outset and supply its members with enough data to hold their interest while the membership was being expanded.

**What Associations Can Do for One Another**

The various associations which have used car plans in operation can exchange the methods used in ironing out their difficulties and the results which were obtained in various ways. Other associations which are attempting to put used car plans in operation can be greatly assisted by forwarding to them an outline of the methods used in combating certain obstacles by the associations which have their plans well under way. A letter explaining how the dealers in one association have arrived at a uniform understanding on points previously at a variance will help the dealers in another association to overcome the same difficulties.

The Washington Automotive Trade Association has requested various information regarding the used car plans of other associations and has offered to forward similar information to any other association which was desirous of co-operating in this manner. This association feels that the exchange of information with other associations will be mutually beneficial.

This association has a very successfully used car plan in operation at the present time and will be glad to extend what help it can to other associations.

### Putting the Plan Over With the Public

The first thing that is necessary in putting the plan over with the public is for the dealer to put it over with himself. He must fully realize that he has got to

buy his used cars 25 per cent under current sales prices in order to make a profit on his business.

Salesmen and appraisers must be brought to a full realization of the fact that they are losing money for their house unless used cars are bought on this basis. This has got to be the general policy of the dealers and their organizations. It has got to get into the human system. Every employee should be impregnated with it.

The dealers, themselves, must take the initiative in drilling this NEW DOCTRINE into their employees and the public. They cannot expect the salesmen to take the initiative in this.

The dealers have got to warm up to it and not shy from it. A great amount of effort will have to be put forth. The new doctrine must be preached and

pounded into the employees and the public. No dealer is going to find a line of customers at his door offering their cars at 25 per cent under market. The finished result is not going to drop in your hand like magic.

There are bound to be some infractions, but if every dealer will tend to his own infractions and continually work towards the objective the whole situation will be changed in a short time and the result will show for itself.

When the dealers get the situation in hand, they can put the teeth in it to hold it. The teeth will work at that point.

This will benefit every dealer equally. It means just as much to the dealer who is on top as the one on the bottom. Everyone should put their full heart in it and their shoulder to the wheel.

Letters of criticism will be appreciated.

## Ready Adjustment Features New Stewart-Warner Shock Absorber

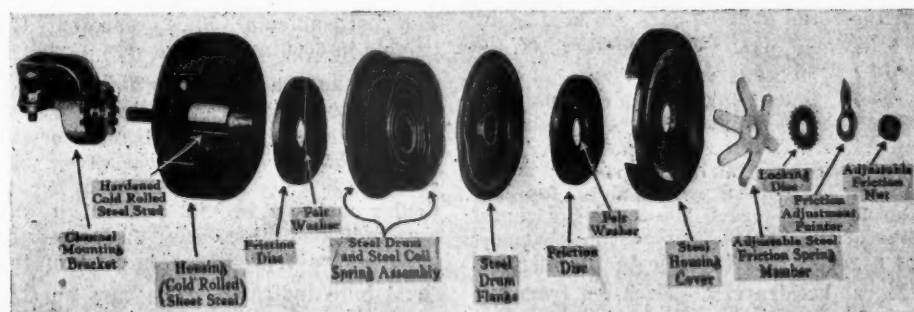
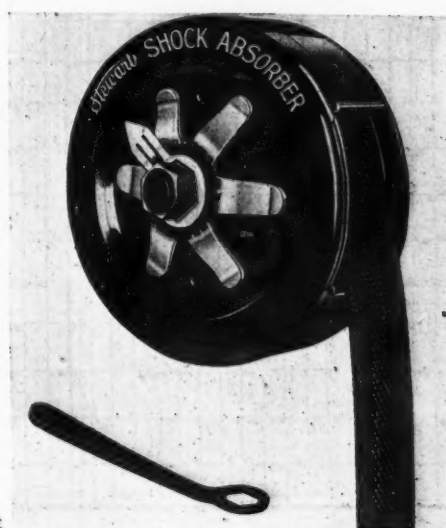
EASE of adjustment is one of the chief features of the new shock absorber brought out by the Stewart-Warner Speedometer Corp., Chicago. No oiling and greasing is required, and there are but two moving parts, the drum around which the webbing is wound and the coiled steel rewound spring. This spring is mounted inside the steel drum, through the center of which passes the hardened steel stud. Bearings are provided on both sides of this drum to afford a free and even action of this part around the center stud.

The rebound is checked by the action of the friction discs against the sides of the drum containing the coil steel spring and not by the pressure exerted on the webbing itself. The friction discs are placed not only on one side but on both sides of the steel drum. The amount of friction these discs exert on the coiled spring is determined by the adjustment nut on the outside of the gasket.

In making the adjustment a small wrench, furnished with this outfit, is used and a slight turn on the adjustment nut gives any desired tension. A pointer over the red adjustment dial enables the driver to easily determine the amount each absorber has been tightened or loosened so that the tension of all is kept

exactly the same. It takes but a minute and a half to make this adjustment.

The drum, spring and friction discs are encased in a housing of sheet steel which is enameled. On the mounting side of this housing a heavy steel washer is riveted, in which a hole has been punched to fit over a hexagon shoulder on the mounting stud. Projections on the outer edge of this washer fit into grooves in the place of the mounting bracket which clamps between this brake and the car frame. These provisions are said to prevent all possible rotation between the shock absorber housing, mounting stud or center bolt.



## DAN'S DIARY

DEC. 13.—Every once in a while when I get to thinking I am some whiz of a repair man and trouble shooter and a bang up mechanic generally Good Night along comes some bird wich aint even in the bizniss and makes me feel like I had auto of been in the sody water bizness for all I know about engines and ignition and all them kind of things.

Today they was a guy blew in to have his car greased and while I was working on the job he starts in asking me a lot of fool questions wich I was answering wether I new the answer or not until he starts tawking about crankshaft tollerences and tork and the cause of fuel nocks and vollmetrick efficiency and almost every thing else Good Nite I sals to myself Dan you better keep still and let some budy tawk that can say a mouthfull.

The worse part of it was that I coulident even do a good job of listening becuz he tawked way over my head. I suppose if I was to set up nights and study a lot of that stuff instead of playing pool with the fellows mabe I would know as much about it as this bird. Anyhow I bet I can fit a bearing better than him and wot does a lot of highbrow stuf like he was peddling out mean if you cant use it. Its a sinch a guy in the repair bizness never gets much chants to use any of them fine points cuz his customers wont pay for it.

Wot they want is a hurry up job that dont cost much and wot they get is a job that aint worth much. If a repair man was to do a regular bang up job like this guy was tawking about gosh, the car would be better than new.

### STAR CAR TIRE SIZES

IN the Nov. 15 issue of MOTOR AGE mention was made in connection with the description of the new Star car that the Star special models are equipped with 31 by 4 in. straight-side cord tires. This was an error, as all Star models are equipped with 30 by 3½ in. tires, the open models having non-skid clincher tires and the closed models straight side cord tires.







# Cause the Owner to Visit the Repair Shop

CLUTCH & TRANS					RUNNING GEAR							BODY					
CLUTCH	TRANSMISSION OPERATION	PROP. SHAFT	REAR AXLE OPERATION	RUNNING GEAR	FRAME	SPRINGS	STEERING	BRAKING	INSTRUMENTS			BODY	TOP	METAL			
FRONT MECHANISM CLUTCH MECHANISM BUSHINGS TRANSMISSION CASE GEARS SHAFTS BEARINGS DIFFERENTIAL MECHANISM SHAFT UNIVERSAL JOINTS HYPERGEAR CASE GEARS SHAFTS BEARINGS HOUSING WHEEL LATHEWORK WHEEL BEARINGS TORSION MEMBER FRONT AXLE STEERING SPINDLES WHEEL SPINDLES FRONT WHEEL REAR WHEELS WHEEL AND PINES OVERHAUL RIGIDITY BRACKETS WHEELS CRACKS BUSHINGS RIVETS & BOLTS LEAKS SHOCKS DATA OUT ADJUSTMENTS WHEELS REAR MECHANISM ADJUSTMENTS STEERING GEAR STEERING LINKS STEERING ROD OPERATION ADJUSTMENTS LIFTING OPERATING MECHANISM OPERATION CLUTCH BRAKES ANNETER BUSHING GULLS FRONT MECHANISM TORSION MEMBER SPREADER FRAME COVERING SUPPORTS FINISH UPHOLSTERY HARDWARE WIND SHIELD INSTRUMENTS REAR WHEEL FRONT WHEEL FRONT MECHANISM FRONT MECHANISM FRAME COVERING CURTAINS HOOD PARADE SHELL FENDERS SPRASH ARROWS SUPPORTS AND FASTENINGS LANDS																	

sheet, however, cover a price range from the lowest to \$3,000.

It is not the thought of those conducting this test that these records indicate so much a record of each car as that they represent a collective condition. It is possible that the particular car picked of any make was an extra good one or that it was a "lemon," but it is believed that the heavy record of repair visits under the spring column represents a condition that must exist.

Attention is also called to the record of bulb trouble. It is not believed that

this is a true record of owner conditions as these cars are run all night.

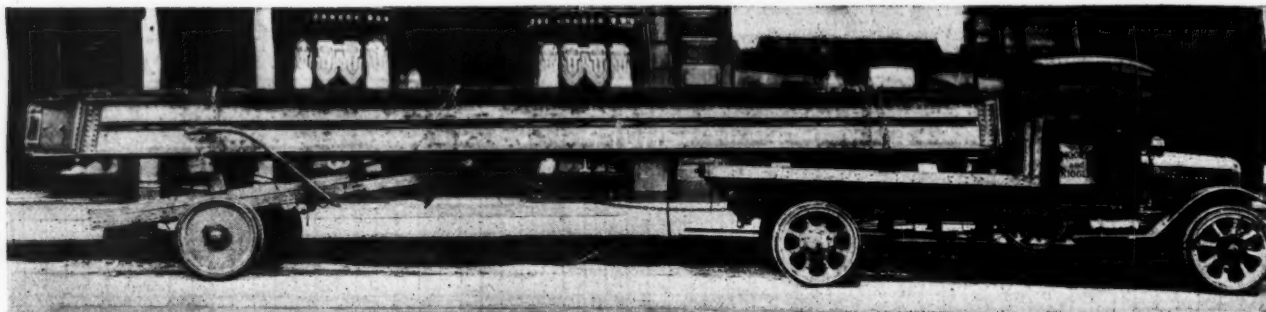
One objective in designing this chart was to provide something by which the repair shop could make a record of repairs that would serve as a guide to the factory engineers. It is, of course, an axiom in engineering departments, that the weak point must be strengthened. The chief trouble of the engineers is to learn exactly what is the weak point. That is pointed out to them by the chart and this record should be sufficient for the engineers. If the engineers knew

what item to talk about, they could easily get the detailed information.

The dealer who wants to compile such information needs only a place on his repair ticket to indicate the model and year of the car and the speedometer reading, and then make a record of the repair under this system.

An interesting feature of this chart is the headings under which repairs are recorded. This list was decided upon after many efforts to get a non-conflicting list that included all calls with as little duplication as possible.

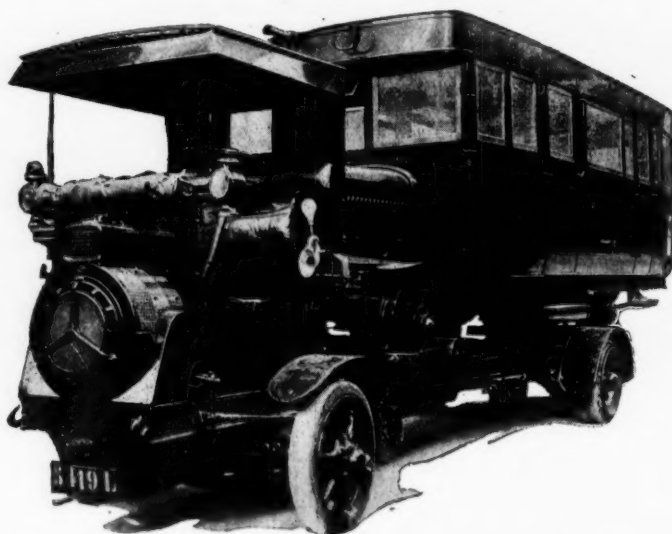
# MOTOR AGE'S PICTURE PAGES



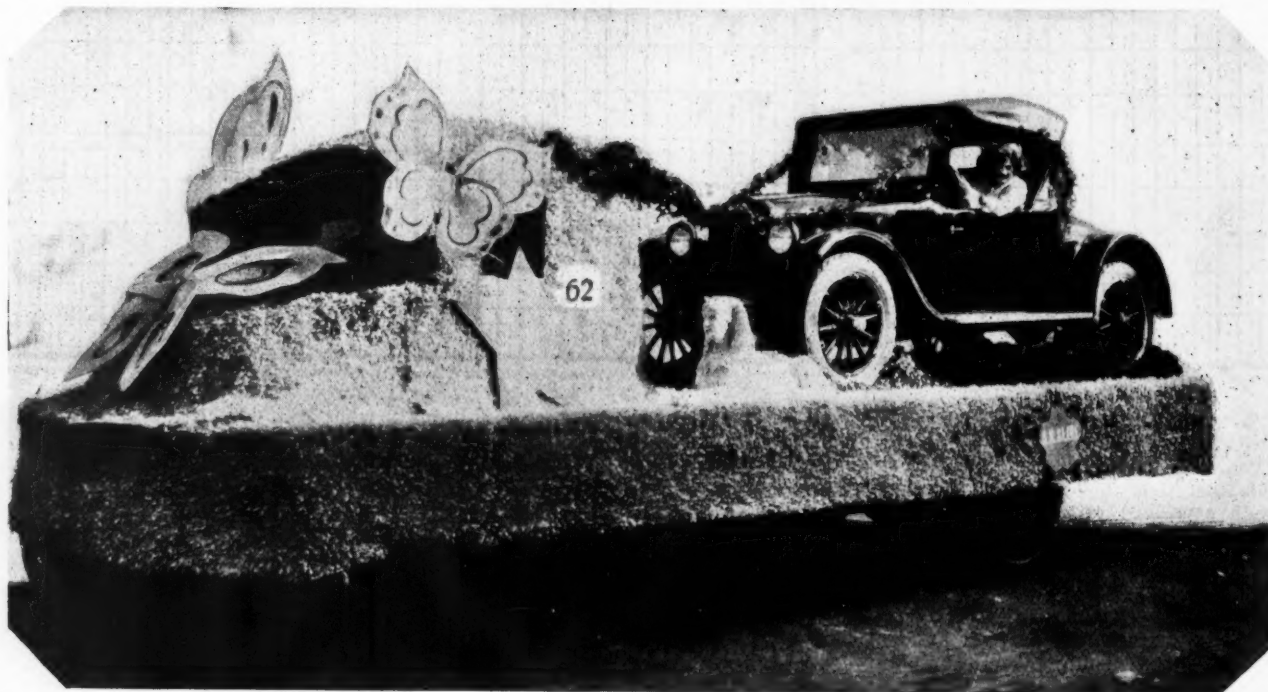
Heralding what is believed to be another world's record—this time for transporting four steel girders weighing nine tons from Pittsburgh to Washington, Pa., aboard a 3½ ton Republic, a distance of 45 miles in a trifle less than six hours



Speed takes its toll. This speedometer of death, erected in Buffalo shows that ninety-nine is the number of fatal accidents so far this year in the New York city



De Dion rail car on special truck for road transportation. (A press agent was not employed to write this caption)



Reading, Pa., dolls up for its 175th anniversary. Floats like this one made up a monster parade which depicted the growth of the city. A. N. Kline, Studebaker dealer fixed up the one shown here



# OF AUTOMOTIVE INTEREST



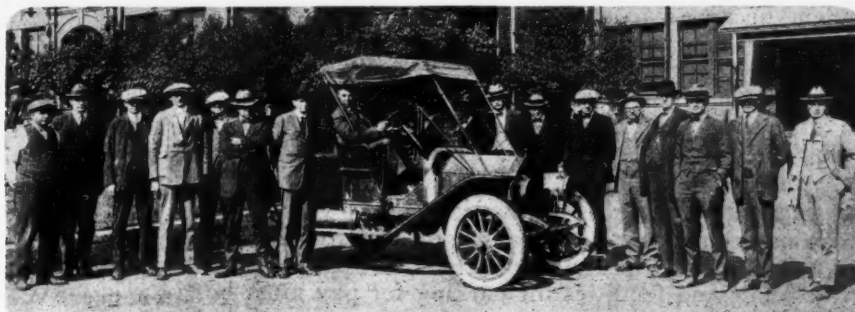
Thanksgiving day at Beverly Hills (Calif.) race. This is what the dealers and manufacturers have to be thankful for. There's a lot of them there but there's still plenty of room in the background



Canned petrol precautions. Inspection with electric torches for rust and dirt is made before these cans are filled for the motorist. This takes place in London where everything is more or less canned



Another way to beat the scheming gasoline barons—buy an elephant. One can also save money in this by not being obliged to buy a front bumper. Joe Becker, the Los Angeles animal trainer will probably supply any demands which your customers make for elephants



1908 saw no flashier car than this Buick grand-father to the valve-in-head motor of today. E. L. Sapp, the original owner is still much satisfied with his purchase



# MOTOR AGE

Reg. U. S. Pat. Off.

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No. 24

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## THE CLASS JOURNAL COMPANY

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## Traffic

WE hope that we have made it plain in previous editorials that we are trying to interest automotive dealers in traffic, accident and parking conditions in their communities. It is the customers of the automotive merchant who are causing the deplorable situation that exists in all centers of population, large and small, and we believe that it is a service the automotive merchant owes to his customers to try and remedy the situation.

If the automotive merchant did not owe this service to his customers, he would still be interested in the problem, because bad traffic, accident and parking conditions are becoming a sharp sales resistant.

We believe that if the automotive merchants of any community will get together on a study of this situation that they can do more than any other group in solving the question. What we are looking for today is a safe and steadily moving traffic and space for reasonable parking. There is a considerable demand for unreasonable parking privileges, and the owners of these vehicles must be convinced that such parking is a private affair and facilities for parking for pay must be provided.

Perhaps the automotive merchants can provide the

capital for day garages where cars can be handled at a reasonable price.

Then, too, many street regulations today are the result of political pressure from a certain group. If this pressure is against the interests of the automobile owning public, the automotive merchants can organize a contrary political pressure. There are many ways in which the automotive merchant can help, the chief point at present being that he interest himself in the local problem.



*Almost every car needs some extra equipment.*



## A Momentous Merger

THE term epoch-making may properly and appropriately be applied to the merger of the two large business publishing organizations, The Class Journal Company and The Chilton Company, which is announced on another page of this issue. In united effort for the advancement of the industries they serve, a new period of usefulness is begun. It will be a period of extended service. It will be a period in which greater accomplishment is assured by the combination of the resources and experience of the two largest organizations of their kind, who will labor together now with mutually augmented strength and influence for the welfare of the automotive industry and all its many branches.

The Class Journal Company and The Chilton Company have grown consistently as the years have passed from the very beginning of the industry. Each has built up a group of business publications in the automotive field which, when conducted separately, have been competitive to some extent and yet when brought together, as they now are, can and will supplement one another and by the elimination of duplicated effort, will serve both subscribers and advertisers with a maximum of value at a minimum cost.

All parts of the field are covered, all branches of the industry are served by the merging of these two groups of business papers. Manufacturing, merchandising, maintenance, service, production, engineering, exporting and the various phases of each of these industrial and trade activities as they apply to passenger cars, trucks, tractors and parts and accessories, are all included in the scope and activities of the publications which will work now with the coordinated purpose and supplementing editorial appeal for the good of the industry as a whole and all groups individually which are parts of it.



*Sales profits are worth more than sales volumes.*



## Do We Believe in Ourselves?

WHEREVER maintenance men meet there is a disposition to tell each other how bad is automotive maintenance. Some of the men who tell these stories hold positions of power and they should be the cause of much good maintenance. Some people congratulate speakers who tell of the badness of maintenance. We recently have come to believe that many persons in the automotive industry have really convinced themselves that automotive maintenance is

actually the worst business proposition in the world.

We of MOTOR AGE do not believe that and we are decidedly critical of maintenance gatherings where the badness of maintenance is the chief topic, because this badness gets to be so much of a topic that those who are doing the talking do not present much that is constructive. In fact, the situation looks so bad to them that they actually get to thinking that it cannot be improved and the only thing they can think of is to pass the buck to some one else.

The facts are that maintenance is not a bad job, as bad jobs go in this age. There are bad spots, we admit that freely, but there also are some very good spots. There are two problems as we see the situation. One is how to improve maintenance today, the other is how to improve it in the future.

With the problem of immediate improvement, the designing engineer has little to do. Rather we would like to hear discussions of how the maintenance man overcame the blunders of the engineer, rather than the passing of the buck to him.

Next we should like to hear some maintenance man tell how he sold his engineers on the problems of maintenance of tomorrow, not how he has failed to convince his engineer that maintenance is important. We believe that every designing engineer in the country has maintenance in his mind and if he is not as interested, as some believe, that it is the fault of his maintenance manager. Why should an engineer go into the field and look under a lot of cars to see some bent axles if his maintenance department has trustworthy eyes.

But the badness of maintenance is our subject. Thousands of stories illustrative of the badness can be told but each of these stories can be matched with a story of a good job done. Each story of insolent treatment can be matched with a story of courteous treatment. For the stories of dealers who have failed utterly with maintenance or service, there are other stories of dealers who have done well with it.

Most important of all, for every story that is told of bad automotive maintenance or service, there are a dozen stories of rotten service from other crafts.

Some day, not too far distant, we want to hear of a meeting being called in which every speaker will be required to tell the facts of excellent jobs of maintenance. Such a meeting, we believe, would be of vast benefit to the maintenance industry of today. It would put some heart into the men who are being unjustly classed as the prize dubs of the world, which they are not.

The greatest need of the maintenance industry today, is that the men engaged in maintenance be sold on their own job to the extent that they can sell it to the rest of the industry.



*Let's make it a Merry (automotive) Xmas.*



### Refusing a Sale

USED cars and used trucks are hard enough to dispose of at any time and when a dealer gets a prospect for either, he should be eager to "jump on it". Not so however, with a certain well known Chicago dealer, or at least with one of his salesmen. For a prospect, who was about the warmest one we have ever seen, needed a truck and needed it right away and went to this dealer to get it.

It happened that he made his call at night, just half an hour before closing time. He found one salesman on the floor—all dressed up as if he might be going to double for Valentino in a ball room scene. The salesman was uneasy and seemed very much in a hurry. The prospect and a friend of his took their time about looking over a likely used truck on the floor and had made up their minds that "this was the one".

The prospect asked for a demonstration. The salesman's reply left him feeling like an inspiration for the cartoon, "When Words Fail Yuh". The "sheik" salesman said, "I'm sorry, but we don't do business that way—we don't make demonstrations at night—you can take the truck and if anything goes wrong with it, we'll refund your money."



*What are You doing about traffic congestion?*



### Running the Government

THE Illinois Automotive Trade Association is asking its members to take an active part in the campaign to have the luxury tax on automotive vehicles and parts removed. The suggestion is a very good one and each member is urged to write to his representative and senators to make a personal plea for the legislators to vote for such a repeal. Manager Zillman thought it necessary to add to his letter to the members the names of the representatives and senators.

We think that Zillman was entirely right in giving this information to his members as our contact with business men, especially those in the larger towns, indicates that quite a number are not informed as to the names of their representatives in the national legislature. The small town dealers are likely to be better informed in this respect than their big town fellows.

For a long time MOTOR AGE has urged automotive dealers of all kinds to get in closer touch with their representatives in national, state, county and city government and to feel free to express their ideas about how this government should be run. No man who is elected to office is likely to be very high handed in his methods or to ignore entirely requests from business men. If you speak, these elected employes of yours will listen. It is a very good thing for associations of dealers and for the dealers themselves to write earnestly and often to their legislators.

In the recent A. E. A. convention one member asked that a form of letter be drafted so that it could be sent to the representatives. It was explained by the presiding officer that a form letter was exactly what was not wanted. If a representative receives several similar letters, he is likely to suspect that some one is engineering something for his especial benefit and then he will consult with his fellows and they will compare these form letters and then dismiss the entire project as some selfish movement by an individual.

The big idea is for you to express your own opinion in your own words and then your letter will carry conviction that at least one voter is critical. There is no reason why a legitimate business man cannot help to run this government if he will get busy and use his influence. So put your paid representatives in government on your list and write to them often.



# November Production 325,135

## Output of Cars and Trucks 10 Per Cent Less Than in October

**Factories, However, Are Busy This Month and Year's Total Expected to Reach 4,000,000**

NEW YORK, Dec. 10.—Estimates made by the National Automobile Chamber of Commerce and based on shipping returns place November production at 325,135 cars and trucks, a decrease of 10 per cent from the October figures, but still 37 per cent greater than in November, 1922.

That the industry will pass the four-million mark in production this year is more than assured, for with the November count duly recorded, December has but to turn out 278,000 to reach the 4,000,000 mark. That this will be comparatively easy is proven by a study of production figures for this year, which show that only once—this year last January with 243,465—has the industry dropped below what December has to turn out to make the goal. Since last March production has been running well above the 300,000 mark, reaching the peak in May, with 393,861. Therefore, it seems a comparatively easy task to put out something like 278,000 cars and trucks this month in order to reach a count that was deemed impossible a year ago when the wiseacres were trying to dope out the possible production for 1923.

That November would show a decline over October was expected by those who have been following the monthly reports. One of the largest producers, Chevrolet, slowed down for inventory, while the Ford company itself was something like 20,000 shy of its usual figures. That the industry should hold up to within 10 per cent of October shows how industrious the others were during the month. December probably will not beat any production records, although it goes without saying that it will exceed December of a year ago with its 228,375, but it is safe to predict that it will surpass 300,000. This, however, will but mark a breathing spell in the industry, for in January several of the largest producers are expected to go ahead full steam in an effort to turn out enough cars to enable the dealers to stock up for a busy spring.

Several of the largest producers have announced their intentions of speeding up in January, with this end in view. General Motors, for instance, has set its mark at 88,000, while Studebaker, Nash and others have indicated that the first month of the year will find them extremely busy. Therefore, it is not at all improbable that most factories will be running at a mid-season pace next month.

## This Year's Production Nears 4,000,000 Mark

The following table shows the production of cars and trucks by months so far this year as compared with the whole of 1922:

	Output	
	1923	1922
January .....	243,539	91,210
February .....	276,934	122,462
March .....	355,030	172,879
April .....	382,695	219,710
May .....	394,088	256,405
June .....	378,507	289,224
July .....	327,993	247,042
August .....	345,202	274,091
September .....	327,273	207,028
October .....	365,107	239,240
November .....	325,135	237,301
December .....		228,252

Total ..... 3,721,503 2,584,744

The 1923 production by months was divided between cars and trucks as follows:

	1923	
	Cars	Trucks
January .....	223,819	19,720
February .....	254,773	22,161
March .....	319,770	35,260
April .....	344,639	38,056
May .....	350,410	43,678
June .....	337,362	41,145
July .....	297,330	30,663
August .....	314,373	30,829
September .....	298,911	28,362
October .....	334,966	30,141
November .....	292,622	32,573
Total .....	3,368,975	352,591

## VAN CLEEF RE-ELECTED

CHICAGO, Dec. 8.—At the annual election of the Automotive Manufacturers' Association last night Noah Van Cleef, of Van Cleef Bros., Chicago, was re-elected president. Other officers elected were: Vice president, C. D. Pettingell, Apco Mfg. Co., Providence, R. I.; treasurer, James T. Greenlee, Imperial Brass Mfg. Co., Chicago; directors, G. F. Disher, Gemco Mfg. Co., Milwaukee; H. S. Pardee, General Automotive Corporation, Chicago; Frank Parizek, Illinois Brass Mfg. Co., Chicago; E. H. Heller, Hill Pump Valve Co., Chicago; Franklin Mayo, Lincoln Products Co., Chicago; C. C. Secrist, Victor Mfg. & Gasket Co., Chicago.

The speaker at last night's meeting was C. F. Beezley, manager of the catalog department of R. R. Donnelly & Sons Co. He explained in some detail the proper methods of compiling catalogs as contrasted with improper methods.

## DODGE DEALERS MEET

BURLINGTON, Ia., Dec. 8.—A score of Dodge dealers in adjacent Iowa and Illinois towns gathered here last week for a one-day conference with A. M. Potter, Des Moines, district representative of the Dodge line. Trade conditions were reviewed and sales campaigns discussed and motion pictures of Dodge tests were portrayed. A dinner at the Hotel Burlington was enjoyed by the dealers.

## Highest Cotton Price in Years Means More Car Sales

**Total Value of Crop About \$1,750,000,000; Increased Demand Already Felt**

ATLANTA, Ga., Dec. 11.—Cotton at southern spot markets passed the 35 cent mark last week, reaching the highest price that has prevailed in years. The result is that this year's crop is now worth approximately half a billion dollars more than in mid summer, with total value of the crop about \$1,750,000,000, one of the largest records in the history of the industry.

Compared with last year at this time the crop is worth about \$500,000,000 more, and compared with two years ago it is worth \$750,000,000 more.

These increases have been immediately noted in increased demand for closed cars from the country districts, with dealers demanding of distributors here approximately 25 per cent more closed cars before Christmas than can possibly be delivered.

In accessory business the increase was noted by a heavy demand from retailers the last week of November and the first three or four days of December for accessories for the holiday trade, with the result that dealers will carry about 20 per cent more stock than last year, and around 35 per cent more than two years ago.

Accessory jobbers during November enjoyed the largest sales in the history of the automotive industry in the South.

## KREBS TRUCK CO. IN MERGER

PLAINFIELD, N. J., Dec. 10.—The Krebs Motor Truck Co. of Bellevue, O., has become a part of the merker known as Amalgamated Motors Corp., according to an announcement by C. W. Blackman of the Amalgamated corporation, which includes the Northway, Winther and Bessemer-American properties. It is said that Blackman soon is to assume general supervision of the manufacturing operations of all the plants in the merger. The Plainfield division is reported to have received a large order for taxicabs for a New York cab company.

## GARAGE CHAIN INCORPORATES

INDIANAPOLIS, Dec. 10.—Directors of the United Garage Chain of America met here last week and adopted a constitution and by-laws. It was announced that the general manager, Tom C. Polk, took up his duties Dec. 1 with offices in the Gary Theater Building, Gary, Ind. It was decided to appoint a state director for each state to obtain membership applications to the board of directors. Articles were drawn up and filed for the incorporation of the organization as a non-profit association.



## Important Merger in Publishing

A MERGER of two large publication interests has just been announced by The United Publishers Corporation of New York, which corporation has contracted to take over all the capital stock of the Chilton Company of Philadelphia and combine this corporation with The Class Journal Company, which they already own.

The new printing plant of The Chilton Company at Fifty-sixth and Chestnut streets, Philadelphia, and the publications of The Chilton Company, namely, Automobile Trade Journal, Commercial Car Journal, Chilton Automobile Directory, Chilton Tractor and Implement Journal and Chilton Tractor and Implement Index, will be continued as before under The Chilton Company, and the publications of The Class Journal Company, namely, Automotive Industries, Motor World, Motor Age, Motor Transport, Distribution and Warehousing, Tire Rate Book, El Automovil Americano, and Automobile Trade Directory, will be continued as before by The Class Journal Company.

There will be but slight change in the personnel of the two companies. Messrs. Artman and Buzby, president and vice-president respectively of the Chilton Company, will retire from active business. Mr. A. B. Swetland will become vice-president of The Chilton Company, and remain as manager of The Class Journal Company. Mr. H. M. Swetland, founder of The Class Journal Company, will remain as president of that corporation. Mr. C. A. Musselman, formerly treasurer and general manager of The Chilton Company, will become president of The Chilton Company, vice-president of The Class Journal Company and general manager of both corporations.

The properties will be operated practically along the same lines as prior to the consolidation, but the merger will give an opportunity for increased efficiency and a wider range of activities.

The paramount consideration which prompted the merger was the economic advantage to both publishers and the industries they serve. It is probably the largest and most important merger that has taken place in the publishing industry in years, and will undoubtedly result in wielding a healthy influence upon the automobile industry.

## More Than 400 Attend Ohio Trade Association Meeting

**Manufacturers, Dealers and Jobbers Get Together for Two-Day Session**

COLUMBUS, O., Dec. 8.—With more than 400 members present, the seventh annual convention of the Ohio Automotive Trade Association, composed of dealers, manufacturers and jobbers, was opened at the Deshler Hotel, Columbus, Dec. 5 and continued throughout the following day.

Over-expansion of the number of dealers and of the number of factories in the automobile business which is said to contribute largely to the conditions from which intense competition is arising, was the keynote of the program made up by the speakers.

Following the address of welcome by Mayor James J. Thomas, C. A. Vane, general manager of the National Automobile Dealers' Association, discussed the general conditions in the business, the size of dealer mortality and phases that lead up to it. He suggested that one of the prime necessities in conducting a profitable automobile business is the elimination of so-called "sucker money" and incompetent men from dealers end of the game.

"The Greatest Asset in Business" was the topic upon which Percy Chamberlain, Detroit, president of the Percy Chamberlain Association, Inc., addressed the session. He stressed the necessity for a more thorough organization of the people in the non-selling divisions of an automobile establishment. He admonished the dealers to pay more attention to making the service department an inviting place.

Carl J. Baer, of the industrial commissioner of the Chamber of Commerce of St. Louis, spoke on obligations of a dealer, and J. S. Knox of the Knox Business School of Cleveland, spoke on "Salesmen Who Know, Get the Money".

George A. Waddle, Akron, manager of the Dealers' Relations Department of the Goodyear Tire & Rubber Co., discussing "The Year 1923 With the Tire Industry," and C. E. Gambill, Chicago, president of the Gambill Motor Co., Marmon and Hupmobile distributors, addressing the members on "What Constitutes an Automobile Dealer" were the principal speakers at the afternoon session.

In the evening a banquet was held for the members.

The meeting was opened Dec. 6 with an address by A. V. Comings, Philadelphia, of the Automobile Trade Journal.

Other speakers during the day included Ray W. Sherman of the Class Journal Co., who talked on the "Call for Leadership in the Automotive Industry," and R. E. Chamberlain, Detroit, general sales-manager of the Packard Motor Car Co., who spoke on "Common Understanding Between Factory and Dealer."

After a luncheon the annual business meeting was taken up. E. J. Shover,

secretary, gave his annual report and resolutions were adopted.

It was resolved by the members of the Ohio Automotive Trade Association, that Congress be urged to remove excise taxes from motor vehicles and kindred products.

It was also resolved that the highways are a public institution and that they should be paid for by everyone, not only the automobiles.

Officers for the coming year were elected. They are as follows: President, Chas. E. Doan, Toledo; first vice president, Dr. F. E. McClure, Akron; second vice president, E. C. Brisley, Columbus; treasurer, O. L. DeWeese, Lima; secretary and general manager, E. J. Shover, Columbus.

Members of the board are as follows: Chas. E. Schmitt, Hamilton, R. T. Kennedy, Bucyrus; Warren E. Griffith, Toledo; R. L. Bhermer, Circleville; Charles Bishop, Cincinnati, and C. C. Welker of Akron.

### 6 HAYNES ZONE MANAGERS

KOKOMO, Ind., Dec. 10.—Six zone sales managers have been appointed to be in charge of Haynes sales in as many zones in the United States, according to an announcement from the administration offices of The Haynes Automobile Co. The appointments are as follows: Harry S. Erd, for the states of Maine, New Hampshire, Massachusetts, Connecticut, Rhode Island, Vermont, northern portion of New Jersey, and New York City and territory; Don F. Whittaker, for the states of Pennsylvania, Ohio, West Virginia, Virginia, Maryland, Delaware, southern part of New Jersey, and the cities of Buffalo, N. Y., and territory, and Washington, D. C.; W. R. Simpson for the states of Arkansas, Tennessee, Alabama, Mississippi, Louisiana and Texas; Fred J. Zimmer for the states of Michigan, Wisconsin, Iowa, eastern half of Missouri, Illinois, Indiana and Kentucky; William A. Peck for the states of Washington, Oregon and California; C. F. Partridge for the states of North and South Carolina, Georgia and Florida.

### 10 ROLLIN DISTRICT MANAGERS

CLEVELAND, Dec. 10.—The Rollin Motors Co. has been assigning dealer territory for the new Rollin car through 10 district sales managers covering all sections of the United States. The company reports contracts already made with dealers call for 20,000 cars in 1924.

The district managers and their territorial headquarters are: F. R. Bump, 1780 Broadway, New York City; U. B. McCurdy, 2025 South Michigan Ave., Chicago, Ill.; Elmer H. Welch, 515 Peachtree St., Atlanta, Ga.; S. A. McGonigal, 9128 Woodward Ave., Detroit, Mich.; B. R. Tewksbury, 19300 Euclid Ave., Cleveland, Ohio; A. W. Crossman, 1029 So. Grand Ave., Los Angeles, Cal.; Geo. S. Winn, 1649 Hennepin Ave., Minneapolis, Minn.; F. N. Morgan, 117 West 2nd St., Oklahoma City, Okla.; I. L. Truax, 147 New Montgomery St., San Francisco, Cal.; E. M. Lang, 170 E. 7th St., Portland, Ore.

## Bloomington Dealers Adopt the Appleby Used Car Plan

**Second Illinois City to Establish Motormart Takes Action After Bankers Indorse Move**

BLOOMINGTON, Ill., Dec. 10.—The Bloomington Automotive Trade Association has adopted the Appleby system of disposing of used cars. This was the second city in the state to take this action, Danville being the first. This provides for the opening of a motormart which will take over all used cars offered to the dealers in trade for new cars.

W. V. Galford, distributor of the Cadillac and Durant cars, was elected president of the Motormart company. The Bloomington dealers have wrestled with the used car problem for many years but have always had difficulty in obtaining unanimity in relation to the various solutions suggested. The Appleby plan is the first which won the approval of the entire membership.

An effort is being made to secure an endorsement of the plan by the Illinois Automotive Trade Association and if successful will likely be followed by the adoption by a number of other local associations. At the initial meeting to discuss the plan, an address was delivered by J. E. Brophy of Detroit who told of the success met with in several Michigan cities and predicted equal satisfaction in Illinois. A number of Bloomington bankers were in attendance at the meeting and endorsed the plan, believing that the idea of divorcing the used car business from that of the new car, being inspired by wisdom and placing the industry upon a sound financial condition.

### NEW YORK EXECUTIVES MEET

NEW YORK, Dec. 6.—The Automotive Luncheon Club, composed of executives in the industry in the metropolitan territory, met for the first time today in the new club quarters in the Hotel Empire, Broadway at 64th street. Since its organization last summer the club has been meeting in the New York Athletic Club. The new quarters include a lounge and dining room, which are reserved for the members and their guests from 11 a. m. to 3 p. m. The club has about 100 members, with S. S. Toback of Marmon as president. The object is to bring executives in the industry together frequently in a social way.

### OHIO ROADS MEETING

COLUMBUS, O., Dec. 10.—The annual meeting of the Ohio Good Roads Federation will be held at the Deshler Hotel, Jan. 16. Among the major topics to be discussed, according to Executive Secretary W. A. Alsdorf, will be a recommendation by the Highway Transportation Department to the Board of Directors to bring about a general traffic survey of the highway system under state control.



## Christmas Accessory and Car Sales in Chicago Are Good

### Holiday Display Makes Sales for Progressive Dealer; Sells Spring Cars Now

CHICAGO, Dec. 8.—Christmas shopping in Chicago accessory stores has brought sales up quite noticeably, Michigan avenue accessory houses having profited to a great extent. Tires have been most in demand while winter driving equipment has enjoyed a much larger sale than last year at this time. Many manufacturers supplied Christmas boxes and wrappings for their products and these have moved more readily than those without.

Of two south side accessory stores, one has had a Christmas display in the window for over a week with the result that many Christmas purchases were made. The other store (just a few doors away) without a Christmas display reports business "as usual for the season".

Some dealers have sold cars as Christmas gifts and many have received orders for spring delivery which were placed at this time because of their Christmas efforts. "Where a man was going to buy in the spring, or trade his old car in, we have persuaded him to order his car now and present the bill of sale to his family on Christmas Eve as the gift. This way, the man saves what he would expend for other gifts and can put this into accessories for the car," explains John C. Hannon, Paige-Jewett dealer at 64th street and Ashland avenue.

Few of the dealers along the row and on the south side have anything of a Christmas display in their salesrooms. However, they have plans and many will have their displays in a few days.

## Hartz Exonerated in Fatal Thanksgiving Day Accident

LOS ANGELES, Dec. 8.—A recheck of the Thanksgiving Day race on the Beverly Hills Speedway shows Eddie Hearne finished in second place instead of third as originally announced and Ralph DePalma in sixth place instead of seventh. The change in position adds \$2500 to Hearne's winnings and \$200 to DePalma's. The change in results makes Hearne's total of championship points for 1923, 1882 and Murphy second with 1350.

Harry Hartz, driver of the car that killed George L. Wade of Kansas City, owner of the Wade Special driven in the race by Harlan Fengler, and Russell J. Hughes, a photographer, and injured Jimmie Lee, a mechanic, has been exonerated from responsibility for the accident by the coroner's jury that investigated the case. The jury reported as its opinion that the accident was unavoidable. Fred Wagner, starter of the race, testified he had given Hartz permission to make a test lap as the result of Hartz's request to try a changed adjustment of the carburetor of his car. Wag-

ner and other race officials also testified that Wade and Hughes were on the track without authority. The evidence showed that Hartz did everything possible to avoid an accident and was seeking to pass other cars drawn up in formation for the start of the race and had every reason to believe he had a clear right of way. Both Wade and Hartz jumped onto the track from the press stand in their desire to get close to the car of Joe Boyer which was afire and apparently were unaware of Hartz making a trial lap.

## Hawkins Quits General Motors; Returns to Private Business

NEW YORK, Dec. 8.—Confirmation of the proposed retirement from General Motors of Norval A. Hawkins as general consultant of the big holding corporation is had in an official announcement this week.

Vice-president Charles S. Mott stated that Hawkins' resignation became effective Dec. 1 and that while the latter has not announced his future plans, "it is not believed that he will retire long from active participation in the automotive industry."

DETROIT, Dec. 8.—Following his retirement as general counsel to General Motors Corp., N. A. Hawkins declares his intention of resuming his private business for the present with a probable statement on his future activities in the automotive industry following the national shows. Hawkins has definite views on the future of the industry and will devote his efforts to the lines in which he is a specialist.

One plan which he has under consideration is to combine the sales activities of several manufacturers in different price classes, with a view to developing a strong dealer organization to handle the products of the several manufacturers instead of scattering sales among several organizations.

### PLAN NEW SINCLAIR CAR

ST. LOUIS, Dec. 8.—Scheel Motors Corp., manufacturer of the Scheel rotary valve engine, reports having closed a contract with a syndicate of eastern automobile men represented by Arthur Sinclair who are going to begin production of the Sinclair car, using the Scheel engine. The contract called for an advance royalty to the Scheel company of \$100,000, it is said. However, the payments are to be paid in installments of \$25,000 each at the end of 3, 6 and 9 months and the final at the expiration of the year. The installments are covered by unsecured notes.

Arthur Sinclair, who says he is president of the new company, claims to have the backing of capital to the amount of \$10,000,000 and that the financing of his company is practically complete. Its factory is to be established at Indianapolis, he says, and production is to begin within 60 days and reach the peak at the end of the year when it is expected between 400 and 500 cars a day will be turned out.

## Industry Putting Its House In Order for Coming of 1924

### December Production Will See Noticeable Drop Due to Inventory-Taking

NEW YORK, Dec. 10.—The automobile industry may be said to be putting its house in order this month in preparation for the busy time that looms ahead with the turning of the year. The house-cleaning in the main consists in the taking of inventory by those concerns which usually take advantage of the holidays to do this, and in tuning up the plants for the production of new models which are expected to be announced at the coming national shows in New York and Chicago.

### Pessimists Cannot Take Advantage of December Seasonal Drop

In consequence December production will experience a noticeable drop, which may well be classed as seasonal and normal because of prevailing conditions. There is nothing at all alarming about this and pessimists cannot take advantage of the drop because the automobile industry never has been in better shape than it is now, especially in a retail way.

Christmas is proving a banner time for the dealers who report from every section of the country a holiday demand that cannot be met, although efforts were made weeks ago to stock up for this business. Closed models are moving fast and it looks as if the warehouses will be emptied in order that Santa Claus may be able to fill his orders.

This holiday business has upset the calculations of manufacturers who have been urging their retail representatives to stock up at this supposedly dull time of the year so that they will be able to meet spring demands. It looks now as if this stocking up cannot take place until after the first of the year when most of the big companies have planned to push production to the limit.

### Need for Dealers to Stock Cars for Spring Business

Makers have every reason to believe that spring business will be such that there will be need for dealers to stock ahead of time and they therefore are planning great manufacturing activities for the first quarter of the year.

December production most likely will drop below that of November, as it has done in the past years, so that no alarm should be felt if there is a drop of five or ten per cent from November's 325,135. This will not in any way prevent the industry turning the four-million mark at the end of 1923. With only about 280,000 to go to reach this, those in the industry feel that the count at the end of the month will show production well over this. A 50 per cent gain over 1922, which itself established a record, is an accomplishment that well shows the condition of the industry at the present time.



## U. S. Helps to Build 26,000 Miles of Federal Aid Roads

One-third Finished in Past Fiscal Year, Report to Congress Reveals

WASHINGTON, Dec. 8.—Approximately 26,000 miles of Federal aid highways are now completed, of which one-third was finished within the past fiscal year, according to annual report of the U. S. Bureau of Public Roads, transmitted to Congress in the annual Agricultural Department report.

At the close of the year, the report states, 14,000 miles of highway were under construction in the various projects and were estimated to be more than half done. An analysis of the highway system shows that of the 1,111 cities of 5,000 population or more in the country, 1,049 of them lie directly on the approved Federal-aid highway system.

The system when completed will total 179,000 miles and will mean that 90 per cent of the entire population of the United States will be either directly on Federal aid highways or within ten miles of it. The total amount of Federal aid actually appropriated up to and including the fiscal year 1923, the report shows, was \$375,000,000, of which \$364,250,000 has been apportioned among the states.

## 659,060,570 Gallons of Gas Produced in U. S. in October

WASHINGTON, Dec. 8.—Gasoline production in the United States during October totaled 659,060,570 gallons, a new monthly record, the Interior Department has just announced. In spite of this record production, gasoline stocks on hand at refineries Nov. 1 amounted to but 946,872,683 gallons, a decrease of 25,832,149 gallons, as compared with Oct. 1.

Gasoline in storage Nov. 1 amounted to 41.6 days supply at the October demand rate. In comparison with the situation on Nov. 1, 1922, the Department's current figures show an increase of 20 per cent in the new supply of gasoline, an increase of 32 per cent in the total demand and an increase of 31 per cent in the refinery stocks taken on the gallonage basis.

### PREMIER REFINANCED

INDIANAPOLIS, Dec. 8.—Negotiations for the refinancing of the Premier Motors, Inc., were completed this week with the filing of mortgages with the county recorder for \$500,000 executed by the Premier and the Line Belt Realty Co. which holds title to the real estate. The new money is to be used for further expanding the production of Premier taxicabs and passenger cars at the plant of the old line company. The sale of bonds for the company was effected some time ago, the officers said. Mortgages were made out to the Fletcher American Bank as trustee for the bond-holders.

The taxicab production at the Premier plant is said to have been doubled within the last two weeks, and it is expected that by the early part of January the output will again be doubled. The large Premier factory is also being used for the Monroe production and the Victor Body Co. also has a portion of the space.

## "Buy Here With Confidence," Is Their Slogan

COLUMBUS, O., Dec. 8.—The Columbus Automobile Dealers' Association, which is composed of more than a dozen dealers and distributors in the Buckeye capital, has adopted a slogan "Buy Here With Confidence" which is being prominently displayed on the windows and the letter heads of the members. This is not a passing campaign but a permanent slogan which is expected to tell the public the names of the members of the organization. The slogan will be used particularly in the sale of used cars and it is designed to show what dealers will stand behind their used cars.

### ITALIAN RACES SCHEDULED

WASHINGTON, Dec. 8.—The International Automobile race for the Florio cup in Italy will be held on April 27, 1924, at Trapani according to advices transmitted to the automotive division of the U. S. Department of Commerce. Following the Florio cup races there will be held on May 4, a speed test of 390 kilometers over the circuit at Trapani, Italy, the prize being 50,000 lire in addition to cups and medals. On May 11 the Misena cup race is scheduled at Caltanissetta, Italy, being 332 kilometers, for 25,000 lire.

### NO TAX—NO LICENSE

BALTIMORE, Md., Dec. 8.—Plans are being made by city officials to protest against the issuance of automobile licenses for next year to persons who have failed to pay taxes on their cars for 1923. They are now preparing a list of the delinquents and when it is completed the commissioner of motor vehicles probably will be asked to co-operate in forcing the applicants to pay their taxes for 1923.

### REEVES TO ADDRESS DEALERS

PROVIDENCE, R. I., Dec. 8.—Alfred Reeves, general manager of the National Automobile Chamber of Commerce, will be the speaker at the monthly meeting of the Rhode Island Automobile Dealers' Association Dec. 18 at the Biltmore Hotel. Dinner will be served at 6:30 and the address will follow.

### NEW PREMIER SEDAN \$3585

INDIANAPOLIS, Dec. 8.—The price of the new Premier seven-passenger sedan, fitted with a McLand body, has been increased from \$3385 to \$3585.

## National Cylinder Regrinders and Motor Builders Organize

Number of Local and Sectional Associations Meet in Chicago and Elect Officers

CHICAGO, Dec. 8.—Organization of a national cylinder regrinders association was completed last week at a meeting here of representatives of a number of local and sectional associations. The name adopted was "National Cylinder Regrinders and Motor Builders Association."

Officers were elected as follows: President, J. J. Fuchs, Jr., Omaha; vice president, J. B. Cook, Memphis, Tenn.; secretary, Charles H. Hart, Chicago; treasurer, Dwight W. Grover, Newark, N. J.; additional directors, T. A. Meyer, Indianapolis, and J. E. Percival, St. Louis.

Principal objects set forth in the constitution adopted are: To promote general welfare and progress of the cylinder regrinding and motor rebuilding industry of North America and to work more closely together in earnest and active cooperation so that the cylinder regrinding and motor rebuilding business shall continue to expand and take its rightful place in the industry.

Publication of an official organ called The Regrinder has been started under the editorship of W. McWain, secretary of the Metropolitan Regrinders Association.

## Ford Canadian Plant to Be in Complete Operation Soon

DETROIT, Dec. 7.—The new plant of the Ford Motor Co. of Canada, Ltd., will be in complete operation by the first of the year, giving double production facilities with capacity for 500 completed cars and trucks daily. The first car built on the assembly line in the new plant was a new type coupe carrying engine No. 451,306, leaving the line at 10:30 a. m. Dec. 3.

By the first of the year the former plant will have been dismantled of all machinery and will be converted into a body building plant wherein the company will take care of all its requirements. Cost of construction and equipment of the new plant represents an outlay of \$10,000,000, and its facilities generally are expected to meet all expansion needs for many years. In addition to its Canadian business the plant supplies all British colonial possessions and the Dutch East Indies.

### FRANKLIN'S BEST NOVEMBER

SYRACUSE, N. Y., Dec. 8.—Shipments from the Franklin Automobile Co. for November were the highest in the past four years. With a single exception, it was the biggest November in the matter of shipments in the company's history, according to Sales Manager S. E. Ackerman.

## Big Building for Kansas City Show



KANSAS CITY, Dec. 8.—The Kansas City Motor Car Dealers' Association has engaged the American Royal pavilion for the 1924 motor show, Feb. 9 to 16. This building was erected for exhibition purposes solely. On two floors it has about 265,000 square feet wide on the arena floor, where the accessories will be displayed. On the lower floor is an area of 133,924 square feet, where trucks, buses, tractors, airplanes and similar exhibits will be placed. Around the building, under cover, is space for 5,000 motor cars, where free parking will be provided.

## Legal Fight on California's Motor Vehicle Legislation

LOS ANGELES, Dec. 8.—California's recent motor vehicle legislation as reflected in the gasoline tax and a provision that the state has authority to appoint traffic officers which must be paid for by the respective counties, has become involved in a legal imbroglio. The appellate court has held that the measure creating traffic patrolmen to be selected by the State Motor Vehicle Department and paid through contracts with boards of supervisors, is unconstitutional. The case may be taken to a higher court but reversal of the ruling is considered improbable. The result means the entire abandonment of the plan for highway patrol or the necessity of providing such service by the various counties. Inasmuch as fines resulting from convictions of violations of the law go into the fund for maintenance of state highways and the counties do not participate, it is questionable if the counties will go to the expense of maintaining the patrol.

The attack on the tax levied against motor vehicle fuels has been made by the Los Angeles Gas & Electric Corp. This company has paid its tax under protest and demands a rebate. The rebate has been refused and suit testing the law will follow. It is provided in the law that if the gasoline tax measure is declared unconstitutional the system of taxes based on horsepower of vehicles which formerly was in vogue, will be restored. Undoubtedly this will bring up tremendous complications as the state now is collecting the fuel tax and if the law is held unconstitutional, the state most likely would have to refund the tax and there would be millions of claims to settle.

## 40 DEALERS MEET IN IOWA

DES MOINES, Dec. 7.—Forty Iowa Star and Durant dealers were luncheon guests of the Graben-Sharpnack Company at the Des Moines Club yesterday noon. The dealers came to Des Moines to inspect the new model Star cars recently announced by W. C. Durant and being shown this week in a special display at the salesrooms of the Graben-Sharpnack Company.

On the program of entertainment was Arthur Brayton, editor of the Merchants' Trade Journal, who pointed out the cardinal principles of successful salesmanship. A. J. Knapp, secretary of the Iowa Automotive Merchants' Association, spoke briefly on business practices of automobile dealers. Taking up the financing of new car purchases, Ben Stern of the Iowa Guarantee Mortgage Corporation, stated that 90 per cent of the automobile purchases made in Iowa this year were financed by time payments. In this connection, he declared that the automobile industry is so organized that time payments are financed cheaply and in a more business-like manner than almost any other industry selling its products on deferred payments.

## 9,000,000TH FORD IN SIGHT

DETROIT, Dec. 8.—Engine No. 9,000,000 is scheduled to leave the production line at the Ford Motor Co.'s Highland Park plant before the end of the year. Total production for the year will be more than 1,975,000.

## REDUCES PISTON RING PRICES

BALTIMORE, Dec. 8.—The American Hammered Piston Ring Co. announces new reduced prices for piston rings ranging from 30 cents for the 2½ to 3¾ in. sizes to \$1 for the 6 to 6¾ in. sizes.

## 50,000 Cars Turned Out by G.M.C. Canadian Factories

27,000 or 55 Per Cent Exported to 64 Foreign Countries; 1000 Stockholders in Canada

NEW YORK, Dec. 10.—Stockholders of the General Motors Corp. have been informed by the big organization that 50,000 cars have been manufactured this year in the Oshawa plant of the General Motors of Canada, of which 27,000, or 55 per cent, have been exported to 64 countries overseas. This compares with 37,260 in 1922, of which 22,000 or 59 per cent were exported. In 1921 production was 15,390, 27 per cent being exported, and in 1920 the count was 22,362. Of the 1923 output 35 per cent was closed cars.

In the way of information for the stockholders General Motors also announces that there are nearly 1000 stockholders residing in Canada who own a total of 485,000 shares of General Motors Corp. stock and that more than 935,000 shares are owned by residents of Great Britain, so that in the Dominion of Canada and Great Britain there are held 1,420,000 shares of stock in the parent organization.

General Motors of Canada, Limited, became a unit of General Motors Corp. in 1918 when the McLaughlin interests were taken over, the McLaughlins remaining in the organization as executives. Following the year of its inception General Motors of Canada launched out on a policy of expansion making plant expansions at Oshawa to accommodate the more extensive manufacture of Buick, McLaughlin-Buick, Chevrolet, Oldsmobile and Oakland. Later GMC truck and Cadillac were added.

As the organization stands now, General Motors of Canada is the manufacturer, while its subsidiary selling organizations include Cadillac Motor Car Co. of Canada, Chevrolet Motor Co. of Canada, McLaughlin Motor Car Co., Oakland Motor Car Co. of Canada, Olds Motor Works of Canada, and General Motors Truck Co. of Canada. From Oshawa they distribute and service for General Motors of Canada.

Since 1921 the Canadian company has been manufacturing for the overseas market in order to supplement the General Motors factories in the United States and to provide the General Motors Export Co. with an additional source of supply for its rapidly expanding overseas business which it handles from seventeen zone offices at important distributing centers.

## 400 SAFE DRIVERS

BALTIMORE, Md., Dec. 8.—Almost 400 motor car drivers who attended the second Safe Drivers' School conducted by the Baltimore Safety Council were given diplomas on Dec. 4. They were presented by Henry F. Baker, general chairman of the Council, and Charles D. Gaither, police commissioner.



## Road Space for Cars Is City's Saturation Problem

### Chicago Automobile Dealers Hear Exposition of Elaborate Plan for More and Wider Streets

CHICAGO, Dec. 7.—From official sources the organized automobile trade of Chicago today heard an impressive exposition of the importance to the automobile business of the development of new and improved traffic facilities. Showing on the screen architects' drawings of proposed street and park improvements, Eugene S. Taylor, of the Chicago Plan Commission, declared that of all the business interests of the city the automobile dealers should be most active in its support because of what it means to their business.

The occasion was the second semi-monthly luncheon meeting of the Chicago Automobile Trade Association under a plan recently adopted to bring the members together and promote educational interest in the civic problems seriously affecting their business. These luncheons are complimentary and members are permitted to bring as many of their employes as they desire.

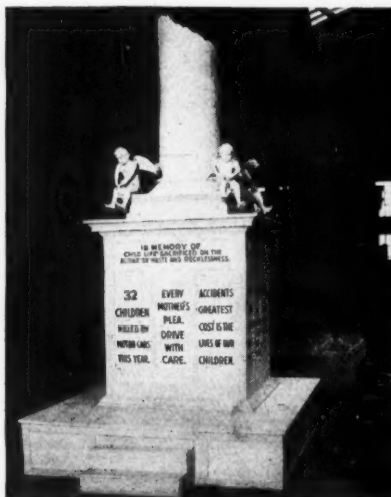
Introducing the speaker at today's luncheon, Henry Paulman, president of the association, declared that the traffic problem is the gravest one before the automobile trade in this city. He said congestion has reached the point where it is imperative that something be done to make room for the hundreds of automobiles being put on the streets by the dealers each week. The speaker supported him in these statements and showed by maps and photographs how a layout of streets and boulevards designed for a city of 300,000 population before the days of the automobile is being called upon to carry the traffic of a city of nearly 3,000,000 in which there almost 300,000 automobiles.

Other maps and diagrams showed vast projects proposed or actually under way to widen streets and extend boulevards, open more through streets, eliminate jogs, straighten the Chicago River and connect up the whole street system so that automobile traffic may be conducted with convenience.

### Washington Holds Annual Meeting; Elects 1924 Officers

WASHINGTON, Dec. 8.—The Washington Automotive Trade Association held its annual meeting and election of officers this week. The following were chosen to serve for the new year: Paul B. Lum, manager of the Autocar Sales and Service Co., president; Raphael Semmes, of the Semmes Motor Co., first vice president; Louis Jullien, of Jullien and Bartram, second vice president; Fred Haller, of the District Motor Co., secretary; Stanley Horner, Buick dealer, reelected treasurer; F. N. Prendergast, of the Pierce-Arrow Agency, and C. Royce Hough, Marmon dealer, directors,

## Making an Impression With Safety Week



ST. LOUIS, Dec. 7.—Observance of Safety Week in St. Louis last week was marked by a number of impressive exhibits calling attention to the destruction caused by carelessness in the operation of automobiles. One of these was a monument to the children killed by automobiles in the city during the year. This monument was erected in Twelfth street plaza. Another exhibit was a donkey blanketed with canvas upon which was inscribed: "What do I care about safety? I am a jackass." This donkey was led about the streets during the week. Members of the automobile dealers' association were active in observance of the week. Classes in safe driving were conducted by Robert E. Lee, secretary of the dealers' organization, and Dan Hyland, president of the Automotive Accessories Association.

to serve three years; Oscar Coolican, Packard dealer, and E. M. Wallace, of the District Oakland Co., directors, to serve one year terms. Installation of officers will take place on Jan. 3.

A considerable portion of the meeting was devoted to study of the report of the Used Car Committee, which outlined a cooperative selling campaign for used cars, through the medium of local advertising and cooperative selling; the advertising to be done in the name of the association and the expense prorated.

### FORD'S OFFER STILL STANDS

WASHINGTON, Dec. 8.—The sale of Muscle Shoals to Henry Ford was again the subject of a conference between the Detroit automobile manufacturer and President Coolidge. Ford called at the White House this week and had a 20-minute conference with the President. The purpose of Ford's call, it was stated, was to ascertain the administration's attitude, disposition and status of Ford's offer for Muscle shoals. Ford, after seeing the President, stated that his offer for the project, now pending before Congress, stood.

### OFFERS PRIZE FOR CAR NAME

CHICAGO, Dec. 8.—A prize of \$100 is being offered for the best name for a new Anderson coupe by the Roy Iverson Co., Inc., Chicago distributor the Anderson cars. The dealer is advertising the contest in the newspapers and inviting everybody to submit names. He hopes in this way to get an appropriate and catchy name that will help in the sale of cars and at the same time provide his sales organization with a large list of interested persons.

## 11,666 Fatalities in 1922, Government Census Shows

WASHINGTON, Dec. 8.—Automobile fatalities in the United States during the calendar year of 1922 totaled 11,666, according to a census just completed by the U. S. Bureau of Census.

The figures show that during that year were 12.5 deaths by automobiles for every 100,000 population. The figures also show an increase every year since 1917 when the first census was taken. In 1917 the death rate was 9.0 per 100,000; in 1918, 9.3; in 1919, 9.4; in 1920, 10.4; in 1921, 11.5, and in 1922, 12.5.

Of 67 cities where the census was accurately kept during 1922, Los Angeles shows the highest death rate by automobile per 100,000, with 29.5. Other high ones in order named are: Camden, N. J. 27.9; Atlanta, 24.7; Paterson, N. J. 24.5; San Francisco 22.3; Denver 20.9. In Detroit the rate was 17.7; in New York, 15.3 and in Chicago, 22.0.

Lowell, Mass., with 5.2 for each 100,000, was the lowest and Spokane second with 9.6. The figures represent only fatalities by automobile and other motor vehicles, excluding motorcycles. The total from this cause during the six year period 1917-1922, was 53,164.

### REO BUYS DUPLEX PLANT

DETROIT, Dec. 8.—By vote of stockholders the plant and real estate in Lansing of Duplex Truck Co. was ordered sold to Reo Motor Car Co. for \$200,000. The Duplex company will move to its former plant at Charlotte and will resume operations. The resignation of H. M. Lee as president and general manager of Duplex was accepted and Joseph Gerson was named to succeed him.

## Canadian Ford Recommends Finance Company to Dealers

### Selects Traders Finance Corp. "Because of Terms and Financial Strength"

DETROIT, Dec. 8.—Ford Motor Co. of Canada, Ltd., has recommended to its dealer organization the use of the finance plan of Traders Finance Corp. of Canada where assistance is required to take shipments into stock or in financing time payment sales. In taking this action the company declares that it has only selected the company whose terms and financial strength were considered best fitted to meet their dealer requirements.

By placing all the business with one financing company, the Ford company declares, dealers are enabled to get uniform terms and centralization of the business works to the advantage of the factory. The finance company, by getting all the business, is also placed in position where it can make better terms and its improved financial condition reacts to the advantage of dealers and the Ford company, it is stated.

Ford dealers in the United States will continue to do business with a number of finance companies. The situation in Canada is somewhat different than here, Detroit officials declare, owing to the lack of financial companies of the size of those in the United States. By doing business with a number of companies the situation on this side of the border is helped. It is also pointed out that the extent of the business in the United States requires the assistance of many finance companies of large capital. Without the development of an extremely large financing company here there is no possibility of the business being concentrated in any one.

## MacDonald Warns Against Certain Regulations for D. C.

WASHINGTON, Dec. 8.—The Senate Committee which is seeking to define the elements of a model traffic law for the District of Columbia has been warned by Thomas H. MacDonald, chief of the United States Bureau of Public Roads, that sound economy should be the test of motor vehicle laws; that over-restrictive measures should be avoided and that overloading causes more harm to the highways than anything else.

"Over-restrictive regulations should not be established and we ought to build roads that are strong enough to hold up under just as heavy loads as ought to be moved from the standpoint of economy, and no heavier," MacDonald told the committee.

### TAX ON SPRINGS REFUNDED

DETROIT, Dec. 8.—The Detroit Steel Products Co. has refunded to automotive distributors handling Detroit springs the five per cent excise tax levied on replacement springs by the government during the war. This is made possible by a claim filed by the company against the

government a year ago and recently allowed, which was based on a ruling by the Internal Revenue Department in September, 1922.

This ruling refers to the fact that a tax of five per cent was imposed on parts for automobiles, then defines an automobile part; then states that leaf springs were in use a great many years before the advent of the automobile; that they are used for many purposes other than automobiles and concludes with the decision that "vehicle load springs distinguished from highly specialized leaf springs, such as auxiliary shock absorbing devices using the leaf spring principle, which are not primarily adopted only for use as a component part of an automobile or motorcycle, are not subject to tax under Section 900 of the Revenue Acts of 1918 or 1919."

## President of Sales Managers' Bureau



CARL MERKEL

CINCINNATI, Dec. 8.—A sales managers' bureau has been organized within the Cincinnati Automobile Dealers' Association and officers have been elected as follows: President, Carl Merkel, Hudson-Essex; vice president, T. E. Byrne, Packard; secretary-treasurer, Al Kistner, Nash and Lafayette.

The program outlined for the monthly meetings to be held this winter includes having a sales manager from another industry speak at each meeting and four members make five-minute talks on helpful sales methods which they have used.

### CHARGE FOR BATTERY SERVICE

SACRAMENTO, Cal., Dec. 8.—Battery dealers in Sacramento who are members of the Sacramento Automobile Dealers' Assn. have put in effect an agreement whereby a charge of 25 cents is made on all battery service. The service includes testing, cleaning, watering and inspection. Practically all of the standard battery agencies are members of the association.

## Sales Continue at "Fair" Average in Boston and East

### Many Sales for Spring Delivery Come Through; Weekly Payments Favored

BOSTON, Dec. 8.—Motor sales are proceeding at what the dealers state is a "fair average" compared with totals month by month for the year. A number of the dealers are now balancing their books, and they find that they have made money this year, some, of course, very substantial sums, others enough to prevent discouragement.

November proved to be somewhat "wavy" in sales. It was slow at the start, then picked up a bit, and again began to slack as Thanksgiving approached. But while immediate sales are acting this way some of the dealers report that the average for orders for spring delivery is increasing. It seems a number of people believe that the prices are at their lowest. So they are making deposits now. Others are taking advantage of the weekly or monthly payment plans being advertised by several motor dealers handling other lines than Fords. And they are ordering more open cars than closed models. Therefore a number of dealers are stocking up now feeling that the 1924 spring demand will be bigger than this year. And allotments are increased.

Used cars are not moving very rapidly so the dealers are planning to get rid of their stocks as quickly as possible. Some dealers now have put all new cars off their floors and are holding special used car sales with the exchange cars on view. The dealers' association committee held a meeting early in the week to discuss the used car situation plans for the winter.

## Franklin Factory Gives New Car to Oldest Continuous Owner

LOUISVILLE, Ky., Dec. 7.—With the sun shining bright on "My Old Kentucky Home," Leslie B. Samuels of Beardstown, Ky., was formally presented with a new Franklin sedan, a gift from the Franklin Automobile Co. of Syracuse, N. Y., manufacturers of the Franklin automobile, in recognition of his record of longest continuous ownership of Franklin automobiles—20 years. Samuels purchased car No. 45 in 1903 and has owned Franklins continuously ever since.

The formal presentation was made by M. H. Carter, district manager of the Franklin Automobile Co. on behalf of H. H. Franklin and the Franklin factory.

### HAYNES ADDS SPECIAL PHAETON

KOKOMO, Ind., Dec. 8.—The Haynes Automobile Co. has rounded out its line of passenger car models on the "60" chassis, by adding a special phaeton listing at \$1395 and a special 5-passenger sedan at \$1945. The prices of these two models are \$100 above their regular phaeton and sedan jobs.



## 1924 European Grand Prix to Be Run Aug. 5 or 6 at Lyons

**Cars Expected to Compete in 500-Mile Event Include Fiat, Delage, Bugatti, Voisin and Sunbeam**

PARIS, Nov. 23 (By Mail).—Lyons was selected today as the scene of the 1924 European Grand Prix road race for 122 cubic inch cars, the date for which has been changed to Aug. 5 or 6. The course selected is a part of the one used in 1914 for the French Grand Prix held only a few weeks before the declaration of war, and in which Mercedes came home first, second and third.

The set of roads constitute a triangle measuring about 14 miles round, the first leg being fairly straight and fast, the base of the triangle being hilly and winding, and the third leg constituting a perfect switchback road terminating in a winding descent to a hairpin turn, constituting the apex of the triangle. The grandstands will be erected at the same place as in 1914, near the hairpin, and will give a perfect view of the cars as they come down the winding hill from the fast leg of the course and will allow spectators to follow the machines for a distance of nearly two miles. The local authorities have undertaken to get together a subsidy of 600,000 francs for organizing expenses.

In addition to the 122 cubic inch race, this course will be used for the French Touring Grand Prix, limited to three classes of touring cars running on a limited allowance of gasoline and required to maintain an official minimum average for eight hours, half of this being at night, and afterwards to run 300 miles at speed. The leading long distance motor cycle race of the year will be held over the same course. It is probable that these two events will immediately precede the 122 inch 500 mile race.

While prospective entrants are not giving out any information regarding their plans, it is known that almost all will make use of supercharger engines. There is a possibility of two-stroke superchargers coming to the starting line, engineers who have experimented in this direction claiming that with full liberty as regards gasoline consumption they can get 150 h.p. out of a 122 inch engine. The firms expected to take part in the European Grand Prix are Fiat with four cars, having Felice Nazzaro, Bordino and Salamano as three of the drivers; Delage with Rene Thomas, Robert Benoist and Albert Divo; Bugatti with three or four; Voisin with three; and Sunbeam with a trio to be handled by Dario Resta, Guinness and Segrave.

### TRUCK COMPANY OFFICIAL DIES

SPRINGFIELD, O., Dec. 8.—Taken ill Nov. 10 with pernicious anemia, Grayson F. Lathrop, 30 years old, assistant general sales-manager of the Kelly-Springfield Motor Truck Co., died last week at the City Hospital.

## Statistics of the Tire Industry

NEW YORK, Dec. 8.—Production of pneumatic casings, inner tubes and solid tires increased in October over September according to the monthly compilation of statistics of the Rubber Association of America.

In the same month inventory of casings and solid tires declined but that of inner tubes mounted. Shipments of casings and solid tires increased and those of inner tubes declined. The following table shows inventory, production and shipments for all of 1922 and for the ten months of this year:

PNEUMATIC CASINGS				
	No. Mfrs. Reporting	Inventory	Production	Shipments
1922				
January	66	4,174,216	2,055,134	1,596,806
February	66	4,691,329	2,084,308	1,562,365
March	63	5,183,286	2,645,790	2,073,963
April	65	5,464,336	2,401,187	2,086,651
May	65	5,523,095	2,721,503	2,639,273
June	64	5,042,147	2,838,890	3,133,260
July	63	4,834,106	2,476,636	2,695,095
August	63	4,629,392	2,905,209	3,029,823
September	64	4,612,037	2,504,744	2,502,106
October	64	4,682,958	2,674,662	2,588,770
November	62	4,964,976	2,733,134	2,379,708
December	59	4,599,208	2,656,942	2,934,079
1923				
January	62	4,695,916	3,127,270	2,994,297
February	60	5,224,387	3,217,987	2,588,639
March	58	5,670,601	3,865,726	3,332,637
April	56	6,088,272	3,539,326	2,976,160
May	57	6,906,594	3,659,986	2,757,764
June	55	7,040,600	2,956,943	2,502,185
July	54	6,471,124	1,992,989	2,539,425
August	58	6,058,387	2,355,915	2,807,432
September	60	5,397,557	2,029,581	2,623,775
October	59	4,876,352	2,361,340	2,819,583
INNER TUBES				
	No. Mfrs. Reporting	Inventory	Production	Shipments
1922				
January	66	5,246,647	2,343,393	1,889,724
February	65	6,141,956	2,596,774	1,702,583
March	63	6,991,118	3,017,511	2,090,737
April	65	7,230,096	2,650,573	2,329,343
May	65	7,189,552	2,970,696	2,938,947
June	64	6,186,534	3,130,629	3,973,679
July	63	5,675,839	3,068,199	3,630,744
August	63	5,207,228	3,808,224	4,220,055
September	64	5,164,757	3,501,442	3,558,971
October	64	5,488,033	3,787,758	3,420,680
November	61	6,210,053	3,850,908	3,075,023
December	59	5,732,125	3,411,074	3,825,949
1923				
January	62	5,838,310	3,951,885	3,748,651
February	60	6,771,958	4,039,202	3,001,697
March	57	7,740,945	4,875,414	3,828,315
April	55	8,394,184	4,259,558	3,535,635
May	57	9,292,223	4,317,537	3,414,115
June	54	8,924,326	3,590,011	3,581,060
July	52	7,527,281	2,666,354	3,942,247
August	53	6,950,578	3,577,922	4,304,034
September	55	6,457,455	3,254,575	3,683,574
October	55	6,898,425	3,855,244	3,595,737
SOLID TIRES				
	No. Mfrs. Reporting	Inventory	Production	Shipments
1922				
January	11	181,769	40,224	33,294
February	11	183,448	39,492	36,805
March	11	182,197	49,433	48,350
April	11	173,748	46,664	52,309
May	11	170,904	57,640	60,711
June	11	169,808	66,089	63,408
July	11	176,375	71,505	60,425
August	11	189,698	84,313	69,435
September	11	200,016	82,767	66,797
October	11	213,942	85,480	71,275
November	11	234,684	85,775	61,466
December	10	244,061	77,221	64,570
1923				
January	11	262,462	83,343	60,611
February	11	270,191	75,457	63,394
March	11	265,843	79,788	77,144
April	10	260,631	71,468	72,609
May	10	269,323	77,288	67,147
June	10	283,425	72,445	52,126
July	10	263,891	42,345	45,219
August	10	262,810	48,141	45,925
September	10	249,379	37,074	45,971
October	10	234,945	37,285	48,065

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipment" includes only stock forwarded to a purchaser.

## December Output Expected to Keep Apace of November

### Deliveries for Show Buying Being Made and Dealers May Carry Stocks

DETROIT, Dec. 8.—Production during December is expected to maintain a pace very close to that of November, although figures will be somewhat reduced owing to the Christmas holidays and the general slowing up of operations for inventory taking or factory overhauling.

In the working days of the month, however, high totals will continue to rule, with some factories showing over the last few months. There will be a gradual straightening away of all factories during the month in preparation for a swing into capacity operation with the turn of the year.

Factories which have been inactive for some time past owing to setting up for new production will, for the most part, get going on their new models during the month but will not get into capacity operation until after Jan. 1.

Deliveries are now going forward to dealers on new models and efforts will be made to have all dealers carry stocks for the start of show buying.

Sales volume throughout the country continues high, due to a large extent to the fact that factories are in a better position to supply closed models than ever before. Makers with popular closed models declare themselves behind on deliveries and expect this condition to continue for some time. This is especially true in the low and medium priced lines. Used cars are being moved, although in some cases at a loss, but the general used car situation is reported improved.

Ford Motor Co. November production will approximate 170,000 and December production will continue at that rate. Tudor sedan output is now about 650 daily; Fordor sedan about 500 and coupe about 1,700. This leaves open models producing the bulk of the output.

Chevrolet during November reached daily high totals in excess of 2,800 and will continue at much this rate during December except for the holidays. Manufacture of Star cars at the Durant plant in Lansing is increasing as the factory gets tuned up for output on the new models. This is expected to reach 400 daily soon after Jan. 1.

Gray production during the month will be somewhat limited, owing to factory changes, but will get into full stride with the show openings. Dodge Brothers will increase its output during December to approximately 600 daily. Buick held close to the 900 daily record of October and will continue at capacity in December. Studebaker will increase its output during December and will swing into heavy production toward the end of the month.

Hudson-Essex is getting back into heavy production this month and will work toward an approximate output of 400 daily. Paige-Jewett is transferring

its Jewett operations to its new plant and operations will be low while changes are being made. The new plant gives a capacity for 500 Jewetts and 200 Paiges daily. Maxwell-Chalmers is continuing at approximately 200 daily and will increase this output as the month progresses.

Hupp will build about 3000 cars in December and will open January on a 200 daily basis. Oakland and Olds are continuing at about 200 daily each. Reo will build approximately 150 cars and trucks daily. Rickenbacker continues at about 50 daily and is planning to double this as factory changes are completed. Dort is building about 60 daily.

Columbia and Liberty are approximating 30 daily. Cadillac and Packard continue to operate at capacity approximating 100 daily.

Packard has increased its output on the single eight to about 600 monthly and the single six ratio is three times this. Wills Ste. Claire is completing its manufacturing plans under the reorganization and is about ready to get into large production. Lincoln continues at about 35 daily which will be increased when the plant equipment is completed.

### NEW DEALERS IN BAY STATE

BOSTON, Dec. 8.—Boston distributors see evidence of a good season in 1924 by the way dealers are being signed up for 1924. The Marmon people have been able to close up the territory in Southern Massachusetts centering in New Bedford with Walter M. Clark, one of the most prominent dealers there. The Noyes-Buick Co. has received word that the Auto Selling & Supply Co. at New Bedford has just taken over one of the largest sales and service stations there for the Buick line. The Haskell-Bouchard Co., Rollin distributors, has been able to close up with the Jordan-Worcester Co. to handle the Rollin there, and he has secured dealers in a number of the other large cities in the state. The United States Rubber Co. reports that its Springfield branch is now housed in new and larger quarters at 101-107 Taylor street. Also in that city the firm of Warriner & Edmonds has been reorganized to handle the Stanley car.

### Christmas Campaign on in St. Louis

ST. LOUIS, Dec. 8.—At a recent meeting of the Motor Accessories Association plans were formulated for an intensive campaign for Christmas trade. Show window designs were submitted at the meeting and are now in the course of construction in windows, signs were ordered printed bearing the inscription "Something for the Car for Christmas". Decorations for the fronts of accessory establishments were decided upon and every detail attended to which would make for the furthering of the Christmas idea. It is expected that these plans will have a decidedly beneficial effect.

## Lee Believes Trade Is Much More Prosperous Than in '22

### Last Two Weeks of November Pull Month Up to Good Level Despite Poor Start

ST. LOUIS, Dec. 8.—R. E. Lee, secretary of the St. Louis Automobile Dealers' Association, believes that the condition of the trade is very much more prosperous now than it was at this time last year. Lee points out that in 1922 at this time there were several dealers who were very shaky financially and who were uncertain as to the future. There is no such condition existing now and the last two weeks of November were good enough to pull the month up to a good level, despite the poor start.

At present sales are very good. The used car situation is better than for some time and the functioning of the new Used Car Bureau has been an aid to those dealers taking part in it. The response to the idea has not been 100 per cent as yet, some dealer refusing to join the body, although they do attend meetings. However, there are a few who complain that the broadcasting of information will do no good as to holding down the prices paid for used cars and Lee admits this is the case and furthermore points out that it is not the intention of the Bureau to control prices, but merely furnish information as to what has been offered by any dealer for a certain car to prevent the customer from placing a fictitious value on his car.

Factories are refraining from loading dealers up with more cars than they can handle and collections are good.

### TIRE INCREASE HINTED AT

AKRON, O. Dec. 8.—Rumors received here to the effect that an increase of tire prices is expected around the first of the year, due to the high cost of cotton fabrics and other reasons, have not been confirmed by any of the big companies, although some of the manufacturers admit that Jan. 1 usually is the time when advances are announced, because of their effect on increasing spring delivery buying. For this reason there may be a slight increase within the near future. However, it is declared that the advance will be small and executed as a sales argument rather than as a profit producer.

### COURT RULES ON TIRE CASE

PHILADELPHIA, Dec. 8.—The appointment of receivers for the Hydro-United Tire Co., Pottstown, Pa., has been upheld by Federal Judge Dickinson, who declared that the business dealings between the tire company and the National Iron Bank, Pottstown, "if not boldly admitted, would be incredible."

Officers and directors of the bank, Judge Dickinson said, had the tire company and its liquid assets "tied up in such a way that while it was free to refuse accommodation, it could block all efforts to get financial aid elsewhere."



## CONCERNING MEN YOU KNOW

**E. Z. Jones**, who has for a number of years been connected with the automobile industry, announces his resignation as sales manager of the Anderson Motor Co. of Rock Hill, S. C., effective Jan. 1. He was formerly with the Winther Motor Truck Co. and the Kissel Motor Car Co. His plans for the future have not been announced.

**C. M. Beckett**, formerly salesmanager of the Springfield Buick Co., will enter business for himself Dec. 15 at 134 and 140 West Main street, Springfield, O. He will head the Beckett Auto Co., which will handle the Hudson and Essex cars.

**C. M. DuMond**, former sales manager for the Cadillac Co., Dubuque, Ia., has been made manager of sales and service of the Lincoln car department of the Universal Car and Tractor Co., Dubuque, Ia.

**W. C. Durant**, president of the Durant Motors, Inc., was in St. Louis last week to assist in opening the Flint factory branch and while he was in the sales room he made one sale.

**W. J. Boone**, manager of the Chicago branch of the R & V Motor Co. of East Moline, Ill., has been elected a director of the company to fill a vacancy.

**Richard P. Joy** has been elected treasurer of Packard Motor Car Co., succeeding F. R. Robinson who has resigned. Robinson was secretary-treasurer of Packard for a number of years. He is succeeded in the secretaryship by M. A. Cudlip, formerly assistant secretary. All other officers were re-elected. **R. P. Joy** is president of the Detroit National Bank of Commerce.

**Verne E. Burnett** has been promoted from advertising manager of the Cadillac Motor Car Co. to the position of secretary of the Institutional Advertising Committee of General Motors by vice-president Alfred H. Swayne. Burnett will be succeeded at Cadillac by William W. Lewis, who has been central district manager for the company. In his new position Burnett will assist in the development of the national advertising campaign to acquaint the general public with the plan, purpose and policies of General Motors.

**Henry Krohn**, vice-president in charge of sales of Paige-Detroit Motor Car Co., has returned to the factory after a two weeks trip to Mexico on which he visited the company's distributor at Mexico City and surveyed the market possibilities for the coming year.

**George A. Maher**, manager of the Kenosha plant of C. M. Hall Lamp Co., has been made a vice-president of that company. He has been manager of the Kenosha plant since it was taken over by Hall from the former Badger Brass Mfg. Co. and is widely known in the industry.

**M. W. Liphart**, for the past 18 months manager of retail sales of the Nash Sales Co., wholesale distributor of the Nash and LaFayette, in Milwaukee, has been promoted to general sales manager, supervising both wholesale and retail

sales. **E. J. Thelen**, until now retail sales and service manager, John G. Wollaeger Co., Studebaker distributor, Milwaukee, has been placed in charge of Nash retail sales.

**James E. Newell**, president of the Newell Motor Car Co., St. Louis Automobile Dealers' Association last week.

**Capt. Eddie Rickenbacker**, of the Rickenbacker Motor Co., recently visited Baltimore where he addressed the salesman of the Cochrane Sales Co., Rickenbacker distributor, on "Salesmanship."

**Don F. Whittaker** has resigned as secretary and general manager of Motor Truck Industries, Inc., to become zone sales manager for Haynes Automobile Co., in eastern and middle west territory. Whittaker's resignation with the truck association will become effective Dec. 31, by which time a successor will have been appointed.

**W. C. Durant** of New York, manufacturer of the Durant and Star cars, was a recent visitor in Omaha. Durant is making the swing through the middle west territory to personally meet his representatives.

**J. H. Lawrence**, for many years in the livestock business at South Omaha, Neb., has been appointed sales manager of the J. W. Smith Chevrolet Co. at Omaha.

**W. T. Calderine**, former president of the Ohio Good Roads Federation, has accepted the chairmanship of the Good Roads board of the American Automobile Association, succeeding Henry G. Shirley, chairman of the Virginia State Highway Commission, who resigned on account of inability to give the time to the work which Shirley felt was needed for this important A. A. activity.

**B. V. Unwin** has been appointed sales manager of Hinkley Motors, Inc., succeeding C. A. Neville who has resigned to become sales manager of Canavan Motors Corp., transportation engineers and truck and equipment distributors on the Pacific Coast. He will also act as Detroit manager for Hinkley in his new connection. Unwin has been with Hinkley for some time past serving as assistant to Neville.

**H. J. Leonard** has resigned as vice-president of the Stephens Motor Car Co. in charge of production, and has accepted an executive position with Willys-Overland, Inc., of Toledo, O. He expects to assume his new position about Jan. 14. His successor at Stephens has not been announced.

**W. G. Downie** has resigned as general sales manager of the Dayton Rubber Mfg. Co. of Dayton, O., to devote his time to a study of certain plans in connection with the tire industry.

**W. C. LeFebvre** has been appointed by Alfred H. Swayne, vice-president of General Motors and director of the Traffic Section, Advisory Staff, as manager of that section, with headquarters in Detroit. LeFebvre has been connected with General Motors for a number of years, handling traffic matters in Detroit.

## 3,136 Cars Are Delivered to Detroit Owners in November

**DETROIT**, Dec. 8.—Cars delivered at retail in Detroit during November totaled 3136, an increase over November totals of last year of 1037. Closed cars delivered were 2119 as against 1254 and open cars were 1017 as against 845.

Truck deliveries in November exceeded the same month last year by totals of 425 to 278. October car deliveries this year were 4692 and truck deliveries 581.

Comparison of the month for the two years shows practically every company sharing in the increase over last year. Ford with 1679 compares with 920 last year. Buick compares 190 to 137; Dodge Brothers has 113 to 77; Studebaker has 84 to 60; Hudson has 67 to 34; Willys-Knight 43 to 17; Maxwell 91 to 37; Oakland 51 to 21; Olds 40 to 10; Overland 80 to 13; Cadillac 65 to 27; Lincoln 20 to 4.

The Ford truck total is 252 as against 193 a year ago. Reo delivered 26 as

against 18. Federal, the leader in the heavy duty field for the month, had 18 as against seven. Dodge Brothers had 25 as against nine. Chevrolet delivered 26. Other leaders in the heavy duty field were Mack with nine; Gotfredson, six; GMC, ten; Ruggles, four and Standard, five. Five Walker trucks were delivered.

### 4-CYLINDER STEARNS INCREASED

**CLEVELAND**, Dec. 8.—The F. B. Stearns Co. has advanced the prices of all models on the 4 cylinder Stearns Knight chassis. The increases range from \$155 on the open models to \$255 on the closed cars. There is no price change at present on the 6 cylinder chassis.

The old and new prices compare as follows:

	Old	New
Stearns Knight, 4		
4-Passenger Phaeton.....	\$1595	\$1750
5-Passenger Phaeton.....	1595	1750
Sport Coupe.....		1995
Coupe Brougham.....	1995	2195
5-Passenger Sedan.....	2095	2350
Sport Sedan.....		2450

## Petition Asks Dissolution As a Reorganization Step

### Dorris Motor Car Co. Directors Seek to Retire Preferred Stock

**ST. LOUIS**, Dec. 8.—A petition has been filed in the circuit court here by stockholders of the Dorris Motor Car Co., asking for the dissolution of the corporation as the first step toward reorganization.

In a statement issued after a meeting of stockholders at which it was decided to take this step it is said the policy of the company is to continue just about the same in the future as it has in the past with the exception that enough assets will be disposed of to enable the directors to retire the preferred stock from the company's books. A satisfactory agreement has been made to this end with the holder of the stock.

After the preferred stock has been retired the directors will be in a position to invite into the corporation new capital with which to properly refinance.

The company's statement issued by J. F. Culver, secretary-treasurer, listed assets to the value of \$800,000 as against liabilities of only \$55,000. Besides the \$100,000 in preferred stock there is \$716,000 worth of common stock outstanding.

The service department with a stock of parts valued at \$200,000 will be continued. There are 1500 Dorris cars and trucks in use in St. Louis in addition to several thousand in other parts of the United States and abroad.

### SALES DULL IN NEW YORK

**NEW YORK**, Dec. 8.—With a few exceptions car sales in New York territory have settled down to the quiet that normally prevails before Christmas and the New York show. The exceptions are popular priced cars which have recently been redesigned. Dealers in several of these makes have completed the biggest November in their history and sales are holding up quite well in the early part of December.

The average situation throughout the territory is just about this: Sales, particularly of closed cars, held up well until about Nov. 15. Since then activity has been slight but it is not a case of complete stagnation and the decline from summer and fall business has not been greater than in most years. Used car stocks of most dealers are not abnormal and in some cases are lighter than they have been at this time of the year.

### STERLING (ILL.) DEALERS ORGANIZE

**STERLING**, Ill., Dec. 8.—The automobile dealers of Sterling have organized an association consisting of 17 car agents and have just staged a show in the new Llewellyn & Scott garage here. The show was in progress for three days commencing Thanksgiving Day and ending Dec. 1.

## BUSINESS NOTES

The Ohio Parts Co., Cincinnati, O., manufacturer of Ohio battery terminals, announces that the Bert G. Cochrane Co., with headquarters in Chicago, has been appointed as its new central states representative and will look after the trade in the states of Ohio, Indiana, Illinois, Michigan, Wisconsin, Missouri and Kansas. The James Boa Co., Ltd., direct factory representative with headquarters in Montreal, will look after the interests of The Ohio Parts Co. in Ontario, Quebec and other Eastern Canadian provinces. The J. W. VanDeGrift Co., 628 Charles Bldg., Denver, Colo., has been appointed Intermountain States representative and will look after the states of Colorado, Utah, Wyoming, Montana and New Mexico.

Directors of the Jordan Motor Car Co. last week declared a special dividend of \$5 a share on common stock payable Dec. 31 to stockholders of record Dec. 15. The regular dividend of 1 1/4 per cent on preferred stock also was declared.

R. F. Townsend, who some time ago bought the patents, fixtures and some machinery of the defunct Townsend Mfg. Co., of Janesville, Wis., from the receiver, and leased the buildings occupied by that company in order to resume the manufacture of the Townsend tractor and engines, has incorporated his new business as The Townsend Co., of Janesville.

To better express the nature of its business, the Wausau Parts Mfg. Co., recently incorporated at Wausau, Wis., to manufacture automotive equipment and parts, has changed the style to Wausau Motor Parts Co. It is now getting into production on a number of lines.

The Zoline Products Co., of 4437 Chickering Ave., Cincinnati, O., has been chartered with an authorized capital of \$5000 to manufacture, buy and sell chemical products for automobiles.

Price-Hollister Co., automobile accessory manufacturer, is incorporated at Rockford, Ill., with \$50,000 capital and stock has been subscribed in

equal shares by Charles W. Price, George S. Hollister, Robert L. MacDonald and LeRoy Donahue. The plant which operated formerly as a partnership expects to add a transmission and Ford truck brake to its list soon.

Fisher Body Co. will build new glass plants at its present factories at Blairsville, Pa., and Ottawa, Ill., for its subsidiary, the National Plate Glass Co., at a total cost of \$10,000,000. With the additional output that the new factories will make available the Fisher company estimates that it will have ample supply for all its body manufacturing requirements.

More than 150 Hassler dealers, distributors and branch managers attend the annual convention of the Robert I. Hassler, Inc., held at Indianapolis Monday, Tuesday and Wednesday of last week, and wound up their business sessions and series of conferences and meetings with a dinner.

Among new Cleveland distributors are the following: F. W. Pettyjohn Co., Salem, Ore.; Motorcycle Supply Co., Appalachia, Va.; Field-Gould Motor Co., Inc., Biltmore, N. C.; Chris C. Koehoe, Schenectady, N. Y.; Bradley-Cleveland Motor Co., Carbondale, Ill.; Harry Heylman, Inc., Spokane, Wash.; Chandler & Cleveland Sales Co., Springfield, Mass.; The Hodge-Lang Motor Co., Indianapolis, Ind.; The Stuyvesant Motor Co., Cleveland, O. and The Schauble-Hirt Motor Co., Erie, Pa.

The Linden garage at Colome, S. D., was destroyed by fire the last week in November. A few cars were also destroyed.

Andrew Murphy & Son, Omaha, entertained 150 dealers from Omaha territory on Dec. 4, to make plans for the coming campaign for the sale of Durant and Star cars.

The Patriot Manufacturing Co. of Havelock, Neb., manufacturer of the Patriot truck has appointed Goldstrum Auto Sales Company, Omaha, as distributors for eastern Nebraska.

### J. R. Lee Made Assistant to President Haynes of Dodge

DETROIT, Dec. 8.—The appointment of John R. Lee as assistant to President Fred J. Haynes of Dodge Bros. was announced last week. Lee will assume his new duties immediately and the announcement of a successor as head of Dodge Bros. interests in Canada will be made later. For the past year he has been in charge of Canadian affairs for the company, following his withdrawal from the Wills Ste. Claire enterprise.

In announcing the appointment Haynes declared he had selected Lee because of his exceptional experience and ability. His work with the Dodge organization in the past year has demonstrated his fitness for the new post. With the large expansion program that Dodge Bros. has under way and with the increasing popularity of the product it has been found advisable to promote Lee to the new position.

Lee is widely known in the industry. Previous to his connection with Wills Ste. Claire he had been high in the councils of Ford Motor Co. and was in charge of welfare work with that company for a long time. With C. Harold Wills he organized the Marysville company, from which he withdrew to join the Dodge company.

### DANVILLE ADOPTS APPLEBY

DANVILLE, Ill., Dec. 8.—The Danville Automotive Dealers' Association has adopted the Appleby system of disposing of used cars through a central market to be known as the Danville Motomart. The association will be incorporated with Harry L. Snyder as president and Dan

W. Beckwith, secretary. A committee has been appointed to select a building suitable for the handling of the second hand cars, taken in as part payment on new cars.

The Danville automotive dealers, have been wrestling with the used car problem for many years and it has always been difficult to find a majority willing to agree upon any plan proposed. The Appleby system, when explained to the membership, appeared to be satisfactory to all and it will be given a thorough trial.

### BIG YEAR FOR WHEELS

DETROIT, Dec. 8.—Motor Wheel Corp. will make the biggest showing in its history this year according to H. F. Harper, president and general manager. Production records show the company is now producing 4000 complete sets of wood wheels and 1500 sets of disk wheels daily, in addition to other automotive parts. Production in 1924 is expected to exceed 5000 wheels, in addition to parts and accessory business.

Gross sales for the nine months ended Sept. 30 were \$15,760,111.65.

### 65 CARS FOR N. Y. SHOW

NEW YORK, Dec. 8.—Lists of exhibitors in the national show announced this week show 65 different makes of passenger cars and seven taxi-cabs—72 in all—have been awarded space. Since the drawing in October there have been two withdrawals, the Princeton, made by Durant Motors, and the Monroe, manufactured by Monroe Motors, Inc., of Indianapolis. Durant announces that the Princeton will not be in production until after the shows.

## Bankruptcy Petition Filed Against Maker of Bay State

### Receivership Action in U. S. Court Follows Appointment of Two Creditors' Committees

BOSTON, Dec. 8.—An involuntary petition in bankruptcy has been filed in the Federal District Court against the R. H. Long Co. The petitioners are three creditors with small claims, who charge preferential payments last November when, they allege, the company was insolvent.

### Other Long Companies Affected

BOSTON, Dec. 7.—Following a meeting called very quietly in Boston at one of the larger banking houses here a few days ago plans were made for handling the affairs of the R. H. Long Motor Co., the R. H. Long Co. and the R. H. Long Shoe Co., all of Framingham, through two committees, one comprising Wilbur W. Higgins, of the Old Colony Trust Co.; George E. Pierce, of the National Shawmut Bank, both of Boston, and John W. Bargefrede, of the First National Bank, Brooklyn, N. Y., to act as the secured creditors' committee, with the other committee made up of G. L. Margeison, of B. F. Goodrich Co., T. M. Regan, of the American Credit Indemnity Co., of Boston, and one other to be selected later, to look after the unsecured creditors. This is the aftermath of the meetings held by Higgins, Pierce, Regan, Robert M. Falkenau, of the Irving Bank-Columbia Trust Co., Brooklyn, N. Y., and W. W. Shepard, Worcester Bank and Trust Co., held during the past few days.

The business has been turned over to the Caswell and Woods Associates, industrial engineers, as a result of "lack of liquid working capital and a consequent inability on the part of the companies to meet their current liabilities." According to the report of the committee of investigation "Messrs. Caswell and Woods estimate the assets of the three companies at about \$1,875,000 and the direct liabilities as about \$1,200,000, and their contingent liabilities at approximately \$800,000."

The principal business now is the building of motor cars known as the Bay State. This was undertaken a couple of years ago when the R. H. Long company had finished up all its government work. Long had previously done some body building for a few concerns, so he decided to become a car manufacturer.

### NEW N. A. C. C. BOSS

WASHINGTON, Dec. 8.—The staff of the Washington office of the National Automobile Chamber of Commerce has been augmented by the addition of a new general manager, succeeding his father Pyke Johnson, with offices in the Transportation building. Johnson Junior arrived recently at Garfield hospital. While Mrs. Johnson is doing nicely, the father announces that the new general manager will not assume office for some time.



## IN THE RETAIL FIELD

Diesing Motor Sales Co., St. Louis distributor for the Rickenbacker car, has appointed the Ustick Motor Car Co., of 334 South Grand Blvd., St. Louis, as dealer. The Rickenbacker organization in St. Louis now includes the Diesing Co., the Ustick Co., the Maplewood Motor Sales Co., the Lau Motor Sales Co., and the Renois-Rickenbacker Co.

The Covey-Ballard Motor Co., Salt Lake City dealer in Fords and Lincolns, has established a special used car department under the immediate management of Grant Wirick. This firm sold a total of 2,600 Ford cars between Jan. 1 and Nov. 1, 1,600 of which were new.

The new Lincoln Sales Station of Schwarz, Clifford & Scott, 640-54 South First street, Louisville, Ky., is the first exclusive Lincoln salesroom in Louisville to be maintained since the Ford Motor Co. purchased the Lincoln factory. The garage at this location also serves as a service station for all the Lincoln dealers in the city.

A. A. Peterson, Inc., large exclusive used car dealer in Southern California, who at one time operated a chain of stores throughout Southern California and Mexico, has moved into a new up-to-date building at 1207 North Western avenue, Hollywood, Calif.

C. W. Joseph, has joined the Dubuque, Ia. motor row with Joseph's Motor Sales Co., handling the Apperson and Flint cars. His salesroom is at First and Main streets.

Miller and Ajax have discontinued their factory branches at Des Moines. The Brown-Camp Hardware Co. will take over the factory distribution for Miller tires in that territory. Ajax tires will be distributed in the future by the Corning Rubber Co., well known tire distributor on Locust street, Des Moines.

J. L. Beyson and Frank H. Moore have purchased the interests of E. H. Bliss in the Bliss-Williams Co., distributor in Rockford, Ill., of the Paige and Jewett cars. C. W. Williams, former secretary-treasurer of the company, becomes president.

Reo Motor Car Co. of California will soon occupy a \$40,000 building erected especially for it at 14th and K streets in Sacramento for its branch in the capital city. The new building, which is of terra cotta construction, will be used exclusively for the sales and service of the company.

New Gardner dealers include: Ideal Motor Co., Leighton, Pa.; I. C. Carbaugh, Lebanon, Pa.; A. & B. Motor Co., Weissport, Pa.; Riverside Garage, 1531 Main street, Norristown, Pa.; H. W. Krause, Park Rapids, Minn.; Schofield Auto Co., Wells, Minn., and Harry Olson Motor Co., 7007 Stoney Island avenue, Chicago.

Recent additions to the Gardner dealer organization have been announced as follows: Robert Oliver, 11 Main street, Oneonta, N. Y.; Heller and Gordon, 654 W. 158 street, New York; Higgins Auto Co., 2406 Grand Concourse, Bronx, N. Y.; Public Service Garage, Oneonta, N. Y. and English and Leonis, Little Falls, N. Y.

The Imperial Auto Supply Co., formerly located at 1015 Locust street, Des Moines, Iowa, has moved to 1012 West Grand avenue.

R. O. Burr, formerly of Grand Rapids, Mich., has taken over the Dodge contract at Marshalltown, Iowa. A business location at North First street has been secured.

Daniels Bros. & Heath, who operate two tire stores in Des Moines, Iowa, have taken a long term lease on a property at 537 West Fifth street, and will open another branch store about Jan. 1.

John Crosby of the Crosby Tire Shop, Boone, Iowa, has opened a branch store at 110 Main street, Ames, Iowa.

Perry E. Bondy, H. C. S. distributor for Toledo and Northwestern Ohio, has just moved into his new salesroom on Madison avenue, at 21st street, Toledo. Formal opening took place on Saturday, Dec. 1. A general reception and dance was held in the evening which was attended by several hundred invited guests.

D. B. Davis, former Buick and Cadillac distributor in Ottumwa, Iowa, is now Buick distributor under name of Davis Motor Co. for Sterling, Ill., and vicinity with offices and showroom at Sterling.

The Rollin-Schroeder Motors Co., Cincinnati, has been chartered with a capital of \$10,000 to distribute and market automobiles and accessories.

The North Shore Apperson Motor Co. has been incorporated and will open a garage and sales agency at 1825 Benson avenue, Evanston, Ill. The promoters include James and Oliver Coon. They will distribute the Apperson car.

The Davis Street Garage Co. has been organized to operate a garage and sales agency at 1015 Davis street, Evanston, Ill.

The Barker Motor Car Co., Danville, Ill., has just moved into a new sales and service building at 225 West Main street. Expanding business made it imperative to procure a larger building. The Barker company distributes Ford and Lincoln cars, and Fordson tractors.

The Illinois Motor Car Co., Farmer City, Ill., has leased the garage building occupied for several years by the Hall & Reeser, and will distribute Ford and Lincoln cars and Fordson tractors. The retiring firm will dissolve partnership on Jan. 1 when the former company takes possession of the structure. Hall will retire from business, while Reeser plans to engage in the automotive distribution alone as soon as he can secure satisfactory location in Farmer City.

The Rudisill Garage, Monticello, Ill., was destroyed by fire on Nov. 20. Excitement over the discovery of the fire resulted in the sudden death of William Wildman, after giving the alarm. Automobiles to the value of \$100,000 were destroyed.

The Templar Motor Sales Co., 502 North Broad street, Philadelphia, is the name of the new organization handling Templar cars.

Hamlin Motor Car Co., 766 Rutger street, Utica, N. Y., has been appointed distributor for the Auburn car.

The following have been appointed as new Auburn dealers: T. D. Gorbey, Wheeling, W. Va.; Arthur L. Lebel, Waterville, Mo.; Kemp's Garage, G. E. Kemp, Prop., Ballston Spa, N. Y.; The New Philadelphia Garage, New Philadelphia, Pa.; Colbin Garage, Baltimore, Md.; Stockholm Garage, Albany, N. Y.; Rice's Garage, Fitchburg, Mass., and The Selby Sales & Service Co., Lakewood, O.

George W. Barr of Sacramento has been appointed northern California distributor for the Traffic Truck. Sixteen dealers are working under Barr.

Among new Nash dealers are the following: Nash Sales Co., Reading, Calif.; Martin Nash Motor Co., Jacksonville, Fla.; Carey Ooe, Farmington, Michigan; Brunn Nash Sales Co., Greenville, Michigan; City Garage, Royalton, Minn.; New Hampshire Auto Co., Manchester, N. H.; Lloyd Putnam, Canajoharie, N. Y. and Hedeon Motor Sales Co., Bucyrus, Ohio.

Ridgeland Auto Co., capital stock \$25,000, has been incorporated at Ridgeland, Wis., to do a general automotive sales and service business. The principals are Isaac Aspen, Hans Erickson and H. A. Hellum.

The Overland Sales Co., Madison, Wis., which has relinquished the Overland and Willys-Knight, has changed its corporate name to Gillespie Motor Sales Co., and will serve as district distributor and local dealer in the Packard, Paige and Jewett. J. F. Gillespie is principal owner and active manager.

The Overland Milwaukee Co., Milwaukee, is a new corporation organized with \$20,000 capital stock by C. L. Lajeunesse, J. H. Haggott and P. C. Gartley. It takes over the retail sales and service departments of the Overland-Wisconsin Co., Milwaukee, distributor of the Overland and Willys-Knight in the Wisconsin territory. All of the owners of the new corporation have been associated with the Overland-Wisconsin Co., which has disposed of the retail business to concentrate on distribution in a wholesale way.

Kudrna Bros., Chevrolet dealers at Phillips, Wis., have acquired the garage and repairshop property occupied by Vincent & Vincent, Ford dealers, and will take possession Jan. 1.

The Union Auto Co., Chippewa Falls, Wis., has been reorganized. The corporation will conduct the garage, service station and automotive equipment store. W. F. Horn takes the Buick franchise. Service will continue to be given by the Union company. John Borofka has been retained as service manager, and L. J. Ermatinger as manager of the equipment department.

Organization has been completed of the Wills Sainte Claire Co. of New York, to distribute cars in New York State, most of Connecticut and all of Pennsylvania, New Jersey, Maryland and Delaware. Offices will be maintained in New York, Philadelphia, Pittsburgh and Baltimore. W. J. Foss, for many years identified with the Foss-Hughes Co., Pierce Arrow distributor, is president of the company and the vice-presidents are A. C. F. Kelleher and A. C. Bigelow. C. B. Amoroso, who has been Locomobile-Flint branch manager in New York, has been appointed wholesale manager.

The Curtis Automobile Co., 142 Eighth street, Pioneer Reo distributor in Milwaukee and Wisconsin, has let contracts for its new headquarters building at Broadway and Martin streets, thus extending the Broadway motor row northward. The building will be 100 by 127 ft., three stories and basement, and cost \$200,000.

## More Cars and Trucks Sold in Rural Texas Than Ever

### Every Farming Section Experiences Shortage; Sell Carload in Less Than Day

DALLAS, Tex., Dec. 8.—More automobiles and trucks are being sold in the rural districts of Texas this fall than at any time in the history of the business, according to reports from dealers in various sections of the state and distributing agencies in the larger cities. This is due to the good cotton crop and the excellent prices received for it. In practically every section of the farming belts of North, Central, East and Northeast Texas deliveries of cars can not be made fast enough to supply the demands. This is especially true of the popular lower priced vehicles.

At Henderson, in East Texas, a solid car load of new Fords was received on Friday. They were sold out before Saturday noon. The dealer said he could not supply the demand because he could not get the cars. At Tyler, in East Texas, five car loads of Fords and two car loads of other moderately priced cars were sold in two days. The farmers took 90 per cent of them. At Paris, in Northeast Texas, dealers can not get cars fast enough to supply urgent demands. The same situation obtains at Sulphur Springs, Mount Vernon and Mount Pleasant, northeast Texas towns.

Traveling salesmen who make East and Northeast Texas declare they have seen more negroes driving new cars this fall than they ever thought would be owning automobiles. Ninety per cent of these negroes are farmers.

The demand for automobiles in East and Northeast Texas has become so great and the supply so limited that "boot-legging" cars has become profitable. What the regular dealer terms "boot-legging" is the practice of going to the larger cities and buying a dozen low priced cars, bringing them and selling them at from \$20 to \$25 higher than the regular list prices of the dealers to persons who do not care to wait for deliveries. The same situation obtains around Marlin, Hillsboro, Waxahachie, Corsicana, Navasota and Hearne, according to reports.

### NOVEMBER GOOD HERE

COLUMBUS, O., Dec. 8.—The month of November on the whole was a fairly good month as far as sales of automobiles is concerned. Buying was up to the record of previous Novembers and in many cases considerably above those figures. As compared with previous months of the present year sales showed a marked falling off, but that was to be expected. There is always a falling off in November and this year was no exception, but the decline in many ways was not as much as usual. Demand is running largely for cars selling from \$900 to \$1800 while there is a fair steady demand for cars higher price.

# COMING MOTOR EVENTS

## AUTOMOBILE SHOWS

Albany, N. Y.	Feb. 16-23	Albany Automobile Dealers' Association, J. B. Wood and L. Y. Long, Managers.	Louisville, Ky.	Feb. 18-23	Louisville Automobile Dealers' Association, George T. Holmes, Secretary.
Atlanta, Ga.	Feb. 16-24	Atlanta Automobile Association, Virgil W. Shepard, Manager.	Milwaukee	Jan. 19-26	Milwaukee Automobile Dealers' Association.
Baltimore	Jan. 19-26	Baltimore Automobile Dealers' Association, John E. Raine, Secretary.	Minneapolis, Minn.	Feb. 2-9	Minneapolis Automobile Trade Association, Walter R. Wilmot, Manager.
Boston, Mass.	March 8-12	Boston Automobile Dealers' Association and the Commercial Motor Vehicle Association, Chester I. Campbell, Manager, 5 Park Square.	Montreal, Canada	Jan. 19-26	Montreal Automobile Trade Association.
Brooklyn	Jan. 19-26	Brooklyn Motor Vehicle Dealers' Association.	Muskegon, Mich.	March 4-8	Muskegon Automobile Trade Association, J. C. Fowler, Manager.
Buffalo	Jan. 12-19	Buffalo Automobile Show Committee, Carlton C. Proctor, Manager.	New York	Jan. 5-12	N. A. C. C. National Show, Eighth Coast Artillery Armory.
Calumet, Mich.	April	Central Storage Co., Jos. A. Savini, Manager.	Oakland, Cal.	Jan. 12-19	Motor Car Dealers of Alameda County, Robert Martland, Manager.
Camden, N. J.	March 3-8	Camden Automobile Trades Association, M. T. Ivins, Manager.	Omaha, Neb.	Feb. 18-23	Omaha Automobile Trade Association, A. B. Waugh, Manager.
Charlotte, N. C.	March 3-8	Charlotte Automotive Trades Association, George E. Wilson, Chairman.	Orlando, Fla.	Feb. 12-16	Subtropical Midwinter Fair Association, C. E. Howard, Manager.
Chicago	Jan. 26-Feb. 2	N. A. C. C. National Show, Coliseum and First Regiment Armory.	Philadelphia	Jan. 12-19	Philadelphia Automobile Dealers' Association.
Chicago	Jan. 26-Feb. 2	Annual Salon, Drake Hotel.	Pikeville, Ky.	Jan. 17-19	
Cincinnati	Feb. 9-16	Cincinnati Automobile Dealers' Association, Harry T. Gardner, Manager.	Portland, Me.	Feb. 25-March 1	Portland Automobile Dealers' Association, Howard S. Chandler, Manager.
Cleveland	Jan. 19-26	Cleveland Automobile Dealers' and Manufacturers' Association, Herbert Buckman, Manager.	Portland, Ore.	Feb. 9-15	Automobile Dealers' Association of Portland, Ralph J. Steahli, Manager.
Dallas, Tex.	Feb. 11-17	Dallas Automobile Trades Association.	Rochester, N. Y.	Jan. 21-26	Rochester Automobile Dealers' Association, S. Park Harman, Manager.
Des Moines, Ia.	Feb. 25-March 1	Des Moines Automobile Trades Association, C. G. Van Vleit, Manager.	Sacramento, Cal.	Sept. 1-10	State Agricultural Society, C. E. Paine, Manager.
Detroit, Mich.	Jan. 19-26	Detroit Automobile Dealers' Association, H. H. Stuart, Manager.	Saginaw, Mich.	March 4-8	Saginaw Automobile Dealers' Association, R. P. Bishop, Secretary.
Elmira, N. Y.	Jan. 21-26	Elmira Automobile Merchants' Association, T. W. Keeton, Manager.	San Francisco	Feb. 16-23	San Francisco Automobile Dealers' Association, G. A. Wahlgreen, Manager.
Goldsboro, N. C.	April 21-26	Chamber of Commerce, W. C. Denmark, Manager.	Scranton, Pa.	Feb. 4-9	Scranton Motor Trades Association, Hugh B. Andrews, Manager.
Grand Rapids, Mich.	Feb. 25-March 1	Passenger Car Dealers' Association, M. D. Elgin, Manager.	Springfield, Mass.	March 3-8	
Great Falls, Mont.	March	Montana Automobile Distributors' Association, Lyman E. Jones, Manager.	St. Louis	Feb. 17-24	St. Louis Automobile Dealers' Association, Robert E. Lee, Secretary.
Green Bay, Wis.	Aug. 25-30	Automotive Division, Chamber of Commerce, W. F. Kerwin, Manager.	Syracuse, N. Y.	Feb. 25-March 1	Syracuse Automobile Dealers' Association, C. H. Hayes, Manager.
Greenville, S. C.	Feb. 25-March 1	Greenville Chamber of Commerce.	Washington Hgts., N. Y.	March 26-31	Washington Heights Automobile Dealers' Association, H. G. Stiles, Manager.
Hackensack, N. J.	Jan. 12-19	Automotive Trade Association of Bergen County, Moe Katzman, Manager.	<b>CONVENTIONS</b>		
Hartford, Conn.	Feb. 16-23	Hartford Automobile Dealers' Association, Arthur Fifoot, Manager.	Albuquerque, N. M.	May 26-31	U. S. Good Roads Exhibition.
Indianapolis	March 3-8	Indianapolis Automobile Trade Association, John B. Orman, Manager.	Chicago	Jan. 14-31	Good Roads Show.
Kansas City, Mo.	Feb. 9-16	Kansas City Motor Car Dealers' Association, George A. Bond, Secretary.	Columbus, Ohio	Dec. 13-15	Annual Meeting of the Ohio Accessory Jobbers' Association.
			Detroit, Mich.	Jan. 22-25	S. A. E. Annual Meeting.
			Montgomery, Ala.	Jan. 21	Annual Meeting of the Alabama Automotive Trades Association.
			New York City	Jan. 5	Annual Meeting of the Automotive Electric Association.
			Syracuse, N. Y.	Dec. 14	First Annual Convention, Empire State Automobile Dealers' Association.

## Securing Prospects

IN a letter to the Gardner Motor Co., Mr. Leghorn, president of the Leghorn Motor Co., Boston, leading Gardner distributor in 1922, tells his company's system for digging up prospects.

"We have two sources for getting prospects," he writes, "one source is those who come into the sales room and the other those our salesmen dig up.

"Statistics show that those calling at the salesroom are the best.

"Our salesmen have no new and wonderful method of getting prospects but we advise them to talk their car consistently and ask those they meet if they know anyone who is likely to want a machine. They copy the registration numbers of cars in front of other dealers' establishments.

"Recently we have done much soliciting of the building trades, carpenters, plumbers, painters and plasterers. Our method is to have a salesman stop at a construction job at about the noon hour and he usually finds little trouble in attracting the attention of the men who are all receiving good wages and have the desire to own a car. Musicians, too, have been buyers lately."



# The READERS' CLEARING HOUSE

## Questions & Answers on Dealers' Problems

### Approximate Determination of Car Speed

Q—Will you kindly explain how to calculate what gear ratio will give the greatest speed, when revolutions per minute of the motor and the tire size are known? For example, I have a Columbia car with a Continental 6-Y engine. The factory informs me that this motor gives its greatest power at 2700 r.p.m., although it will turn up 2800. Tire size is 31x4. We will suppose that the heavy touring body is removed from the chassis and very small light body or bucket seats were fitted, which greatly reduced the weight. What number of teeth in the pinion gear, and what number of teeth in the ring gear would be right to attain the greatest amount of speed and why? I should like this explained so that I can figure it out for myself on any car.—Earl B. Dunkel, Canajoharie, N. Y.

We will supply you with a formula that will give you the speed in m.p.h. after the factors mentioned are known. It must be borne in mind, however, that it is possible to install a ratio in the rear axle that will be so low that the engine will not have power enough to overcome the road resistance, torque and wind resistance. Up to speeds of 75 m.p.h. and possibly 80 m.p.h. you can use the formula without considering those factors on a car of average weight.

However, where the weight exceeds say 2500 pounds deductions must be made to compensate for the power consumed in moving the vehicle. The formula is as follows, the speed in miles per hour of the vehicle is obtained by r.p.m. of engine times rear wheel diameter times .002975 over the rear axle ratio. With this formula the following holds true:

r.p.m. equals revolutions per minute of engine.

W.D. equals diameter of rear tire.

.002975 equals a constant.

Ratio equals the ratio of the gears in the rear axle housing.

$$\text{Speed} = \frac{\text{R.P.M.} \times \text{W.D.} \times .002975}{\text{Ratio}}$$

Now taking the Continental 6-Y engine as an example at 2700 r.p.m. times the tire size which is 31 inches we get the number 83,700 divided by .002975 equals .0249, now if we use the 4 to 1 gear ratio the speed in miles per hour will be

249

— equals 60.2 m.p.h.

4

By using any ratio that you may think suitable it will give you the theoretical speed, for instance, if you use 3½ to 1 you can find the theoretical speed by dividing 249 by 3:75.

**The Readers' Clearing House**  
*THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.*

*All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.*

*Readers' names will not be published with articles, if a request to this effect is received with the letter.*

*Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.*

*Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.*

*Addresses of business firms will not be published in this department but will be supplied by letter.*

*Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.*

### DATA ON WINTHER TRUCK

Q—Kindly give us all available data on the 1919 model 48 Winther truck, particularly rear axle make and both truck and manufacturers address as we are unable to secure parts in this territory.—Edward Holland Co., Inc., Glendale, Calif.

The following are the specifications of the Winther truck:

Wheelbase—150 inches.

Frame make own.

Tires—Straight side solid 36x4.

Wheels—Cast steel.

Make of wheels not known.

Engine make—Wisconsin.

Size—4 cylinder, 4x6.

Cylinders cast in block.

Ignition—Eisemann magneto.

Starter—None.

Generator—Bijur.

Governor—Simplex.

Carburetor make—Master.

Clutch type—Dry plate, Borg & Beck.

Gearset make—Brown-Lipe.

Number of speeds—Four.

Axle make—Clark.

Total gear reduction—7 to 1.

Drive taken, by springs.

Spring make—Mather.

Steering gear make—Ross.

The address of the Clark Axle Company is Buchanan, Mich., and at the present time we understand that the Winther Motor Company is being reorganized and that its address is the Winther Motor Truck Company, Kenosha, Wis.

### ARMATURE TESTING WITH D. C. AND ARMATURE WINDING TERMS

Q—Advise how to test generator armatures if there is no alternating current available so that a growler cannot be used. We have 110 volt D. C. and our method so far has been to use one cell of a storage battery with a 30 ampere meter. This method however, does not seem to work out very well unless the armature is badly shorted.

1—We would suggest your getting one of the old Delco ignition relays or any other low resistance vibrator and trying it in series with your growler, using one or two 6 volt batteries or more if necessary to get the correct action. There are also on the market armature testers working on the vibration principle and we will give you names of one or two concerns which make these.

2—In armature winding diagram what is meant by coil pitch and what is meant by such words as leads top 1 bottom 14 right?—Chicago Subscriber.

2—Coil pitch is the number of slots from one side of the coil to the other and is usually evident from a diagram. When coils are placed in the slots there is usually the right side of one coil and the left side of another coil in the same slot. The coils are all placed in the slots in a systematic way with, for example, the right side of a coil in the bottom of a slot and the left side of a coil at the top of a slot. The leads from the coils are then known as top and bottom leads, while the instructions referred to tell where these leads should be connected.

In any diagram it is customary to call a certain slot No. 1 and then number the slots around to the right. The commutator bar that lines up with the No. 1 slot is called No. 1 bar and the bars are also numbered around to the right. In this connection you might refer to page 81 of the Winther Service number of MOTOR AGE where an armature diagram is given. In this diagram the coil pitch is 1 and 6, while we have top leads 7 and 8 left, that is 7 and 8 bars left of No. 1, starting to count with No. 1. Also bottom leads 14 and 15 right starting to count with the No. 1 bar.

## Individual Garages in This Building Layout

Q—Attached hereto you will please find pencil sketch covering plots marked 1 and 2, on which it is our desire to locate drive-in filling station, with underground tanks capable of taking care of gasoline in tank car lots.

In connection with filling station, we desire to put in both a washing and greasing rack, also as many individual garages as possible, meanwhile giving ourselves space for office and accessory department that will enable us to take care of a jobber's proposition on bearings, piston pins and bushings, piston rings and carbureters. Understand this location is to front on Fourth Avenue.

We will appreciate very much if you could let us have this information at your earliest opportunity.—Williamson Auto & Truck Co., Williamson, W. Va.

In our plan number 536, we have endeavored to lay out a building that would fulfill the conditions you have given us. We are not positive about the angle of the sides to one another but have taken it for granted that your sketch was laid out about right and have copied the angles of your layout in our plan.

As to the individual garages, we believe it will be a much better arrangement to have them open on the back street, rather than try to face them on the filling station side, since it would be necessary to have considerable space for cars to get in and out of the garages.

We have specified a wash rack after the plan shown in MOTOR AGE of October 11 and have used pits instead of elevating the grease rack on account of the saving in space. If you do not care to go to the expense of building this type of wash rack and prefer the elevated greasing racks, the elevated kind could be built in the space now taken by the wash rack and the wash rack installed where the pits now are shown.

The stockroom may appear to be a little small for the use to which you wish to put it but, no doubt, you can find extra space overhead by building some sort of a balcony. It may also be that you can

### Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things,

we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

cut down on the space used for the office and show case, making the stockroom larger. If any of the suggestions for the increased stockroom space are unsuitable, one of the individual garages might be turned into more stockroom space. The one on the corner of Russell and Amos streets would be quite handy to the office and, by keeping a small amount of stock in the stockroom as shown in our plan, the excess stock could be taken care of in the larger room.

We believe that the filling station position is the best that could be found because, as you say, the main street is Fourth Avenue and it would be much more convenient for customers to drive in and out as we have shown than it would be to locate the filling station in any other part of the lot.

### HEAVY OIL IN FORD CLUTCH MAKES STARTING HARD IN COLD WEATHER

Q—What makes my Ford touring car hard to start in the cold weather. I had a Zenith carburetor put on it a few months ago. New magnet and field coils. When it is a cold morning I have to jack up the rear wheel. After the motor runs a while it is easy to start. What causes this, is the carburetor not adjusted properly or what?

1—This trouble is caused by the high speed clutch not fully releasing. The dragging of this clutch may be caused from too heavy an oil between the discs, or the cam which controls the throwout not having sufficient throw. There is a hexagon headed screw with lock nut on

the high speed control shaft which adjusts the throw of the cam for the high speed clutch. If adjustment at that point does not remedy the trouble make sure that the clutch is not adjusted too tightly at the three fingers which are visible when the transmission cover is removed.

A method often used by Ford drivers to prevent dragging of the clutch on cold mornings is to leave the car in high gear after the days running. When the engine is warm and the oil warm this tends to force oil from out between the discs, with the consequence that there will be little oil left to congeal and cause dragging when you start the following morning.

2—What races did Jimmy Murphy win in Europe and what make car did he drive?

2—Jimmy Murphy won the French Grand Prix in 1920 with a Duesenberg Straight Eight. About two months ago he went to Italy and entered in the Monza or Italian Grand Prix. In this race he drove a Miller Special eight cylinder car and finished third.

3—What speed should a Zenith carburetor do on a Ford touring car?

3—We cannot state definitely, however it should give about the same speed as the regular Ford carburetor if properly equipped with jets.

4—Is the regular Ford Kingston carburetor better to use in the winter than a Zenith?—John Barna, South Bend, Ind.

4—It is contrary to the policy of MOTOR AGE to recommend or condemn any such articles of automotive equipment. We believe however, that any standard carburetor that is equipped with the proper internal specifications for the particular engine will give good starting in winter. In other words we believe that the Zenith will be very satisfactory for winter starting providing that you have the correct jet equipment.

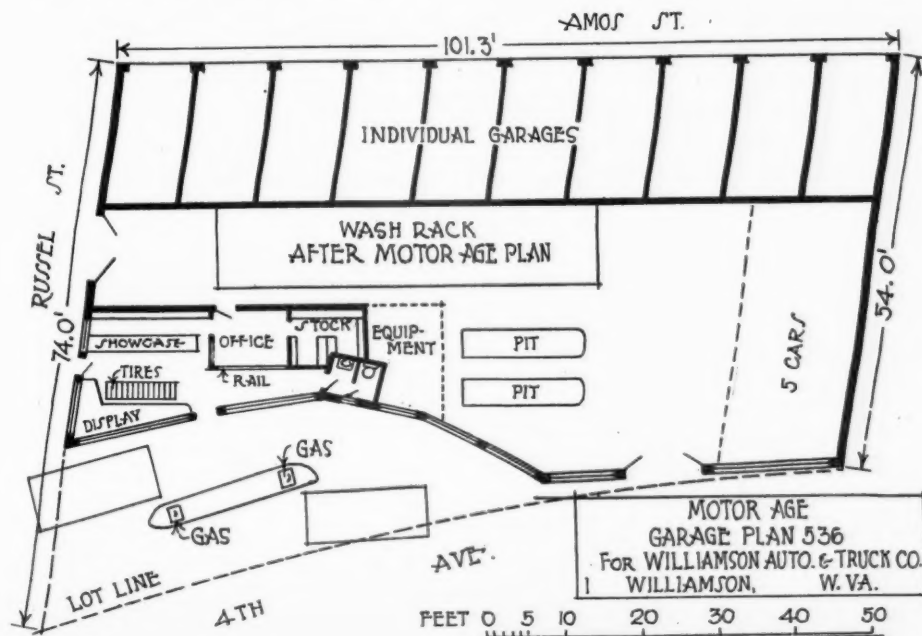
### DATA ON 1920 GRANT

Q—Advise what year a Grant 6 engine No. 3463, serial No. 52735, model H H, was built.

1—The model of Grant in question was built either late in the year of 1920 or early in 1921.

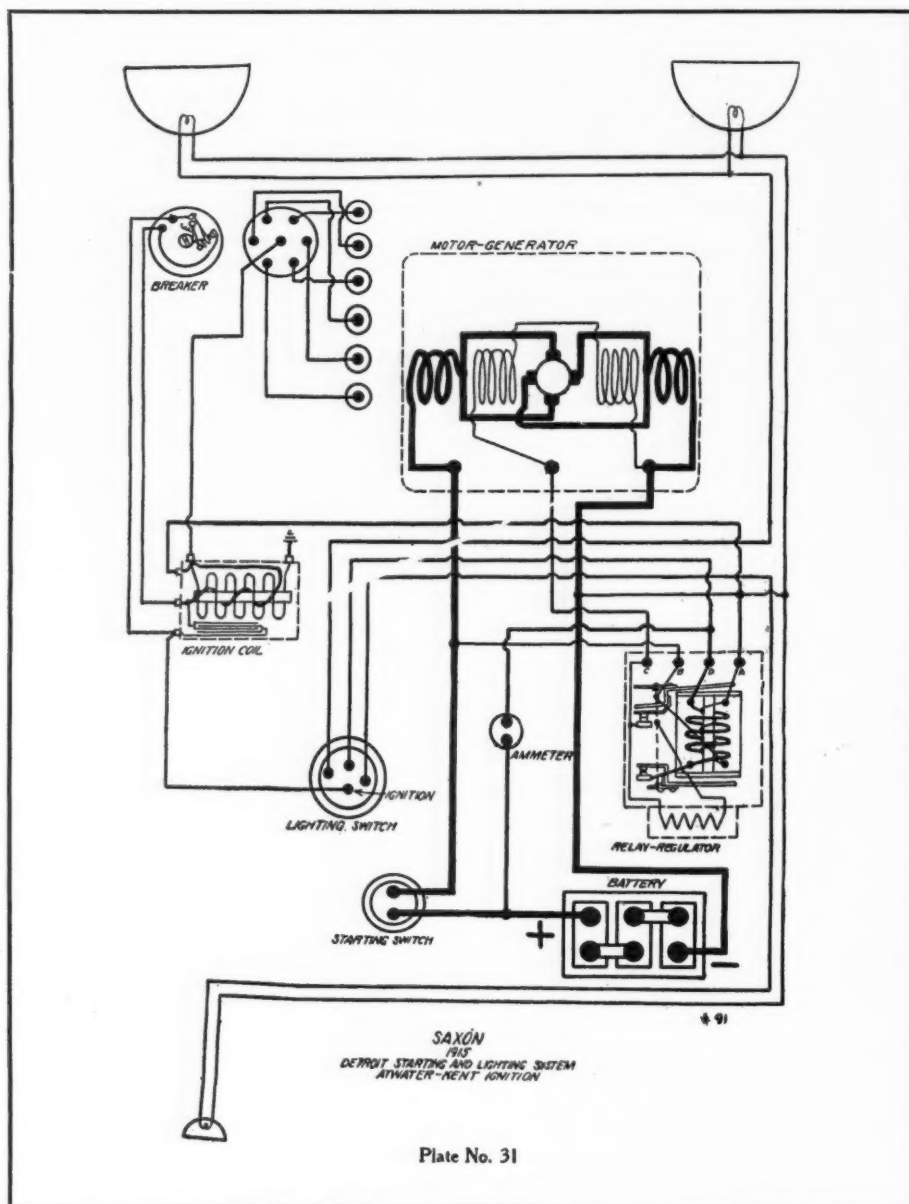
2—Where can I buy parts for said car? If possible, please name several concerns.—J. A. Johnson, Gary, Ind.

2—According to a news item which was printed in MOTOR AGE last year, the entire stock of repair parts and the service facilities for the Grant was sold to the Standard Motor Parts Co., of Cleveland, Ohio.





## Wiring of Saxon Four



Q—Send wiring diagram for baby Saxon four. This car has a Ward-Leonard automatic dynamo controller mounted on the dash and the name I find on the motor generator is "The Detroit Starter

Co., Detroit, Mich." This is the single unit type using two starter cables and one generator wire.—C. M. Bell, Hoisington, Kansas.

The diagram in question is shown.

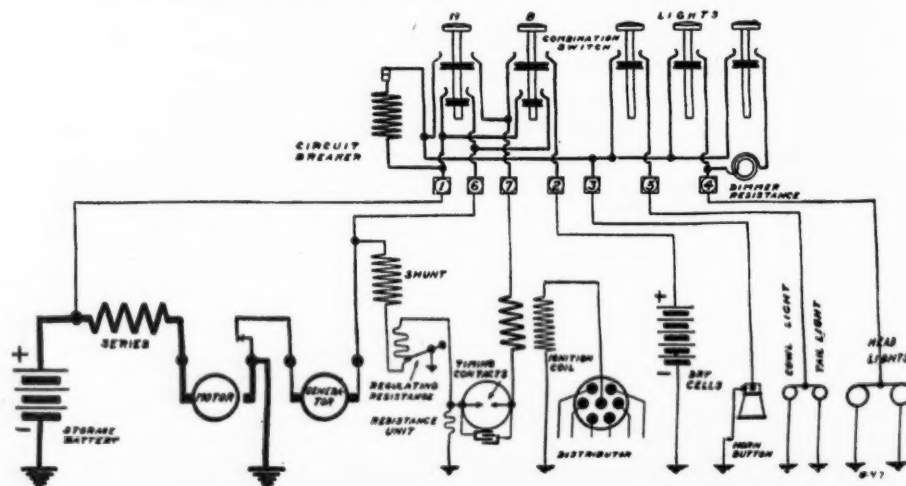
## WIRING DIAGRAM OF 1915 BUICK

Q—Send wiring diagram for Buick 4, 1915 model C 37.—Everett Highsmith, Chicago Heights, Ill.

Diagram requested is shown.

2—Where could I get instruction book for this model? Have written Buick Motor Co., but they have none.

2—About the only other source of supply would be some of the second hand car wrecking dealers. However, if there is any specific information which you desire we perhaps will be able to supply it.



## WHEN ACID AND ALCOHOL FREEZE

Q—Send us information in regard to the temperature at which storage batteries freeze under different conditions of charge.

1—You will find data on this subject in the Winter Service number of MOTOR AGE which was the issue dated November 1st, 1923, the curve you need being shown on page 46.

2—Give information on the freezing point of radiator solutions with water-alcohol mixtures also with water, glycerine and alcohol.—Jordan Hardware Co., Gordon, Neb.

2—On page 52 of the Winter Service number you will find information in regard to the mixtures of water and alcohol.

When glycerine is used it is customary to mix equal quantities of alcohol and glycerine together. Then certain percentages of this mixture are put in the water. With 15 per cent of the mixture the freezing point is 20 degrees, with 20 per cent of the mixture the freezing point is 15, with 24 per cent the freezing point is 10 degs., with 27 per cent the freezing point is 5 degs., with 29 per cent the freezing point is zero, with 30 per cent the freezing point is 5 below zero, with 32 per cent the freezing point is 15 degs. below zero Fahrenheit.

## CRANKSHAFTS NOT INTERCHANGEABLE ON BUICK

Q—We have a Buick D-45 using bronze back main bearings on which the crankshaft and block are in bad shape. We also have a H-45 crankshaft, block pistons and connecting rods. Would it be possible to fit this H-45 shaft and block to the D-45 engine? Would the H-45 bearings fit this crank or would it need special bearings? How would the timing gears work, and also the lower crankcase or oil pan?—Howard M. Stevens, Maywood, Neb.

The crankshaft in the model D-45 Buick is lighter than the H and therefore is not interchangeable. Although slight changes are made in the crankcase and timing gears, they can be applied by small amount of machine work. The change, however, is not recommended by the Buick company.

## Hudson Speed Car Bites But Will Not Bark

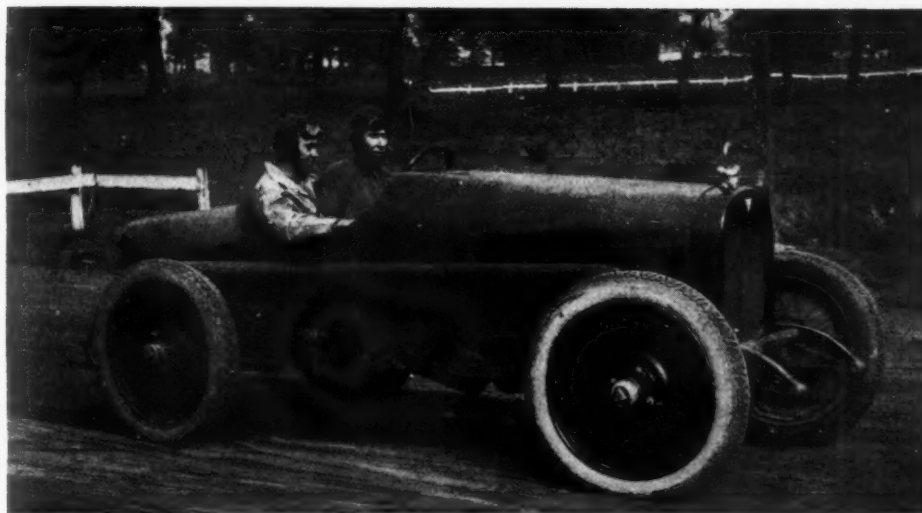
Q—I am writing you in regard to a 1921 Hudson that I have built into a racer. The car operates satisfactorily and I won third place in a 25 mile race on ½-mile dirt track Thursday. This was very good considering that the car was designed for a 1¼-mile track.

The car disappointed me however, in the sound of the exhaust. It makes no noise at all while one of the Fords and an Essex sounded wonderful. I cannot understand why this motor does not make a noise or moan as it is usually called.

I have made a rough sketch of the manifolds and exhaust pipe showing the size and shape and from the sketch you can see that the ignition distributor is in the way of No. 1 exhaust outlet. The exhaust manifolds are larger than the openings in the cylinder block even where they bolt to the cylinder block, and the exhaust has a free passage from the motor.

This motor does not sound as good as my Hudson towing car does with just a cutout on it. Advise what changes I can make to increase the sound. Will be glad to give details to any one who is interested in building a similar car.—Dean Hill, Princeton, Ind.

The lack of sound does not mean that you lack efficiency in the engine for you



have probably done too good a job on the manifold. All six cylinders feeding into one manifold makes it possible for the pressure to equalize to a great extent before the exhaust flows into the outer air. For extreme noise separate exhaust pipes leading out about two feet and then

discharging into the air would be best. If you cut off the long exhaust pipe about at the driver's seat and allow it to expand into a 9 or 10 inch drum you will no doubt get a sound that is considered highly satisfactory although the engine will operate no better.

## SIMMS-HUFF 12-VOLT SYSTEM CHANGED TO 6 VOLTS FOR GENERATING ONLY

Q—We have a customer who has a 1916 Maxwell and is in need of a new battery but does not want to go to the expense of buying a new 12 volt. Can he use a 6 volt battery in connection with a 12 volt Simms-Huff generator? He does not expect to use a starter and only wants to use battery so he can have lights and of course he can buy a 6 volt battery much cheaper. So the principle thing we wish to know is will a 12 volt generator charge a 6 volt battery or will it burn out the 6 volt battery?—W. G. Robertson, in care of Fanders & Robertson, Diller, Nebr.

The Simms-Huff generator will charge the 6 volt battery satisfactorily provided

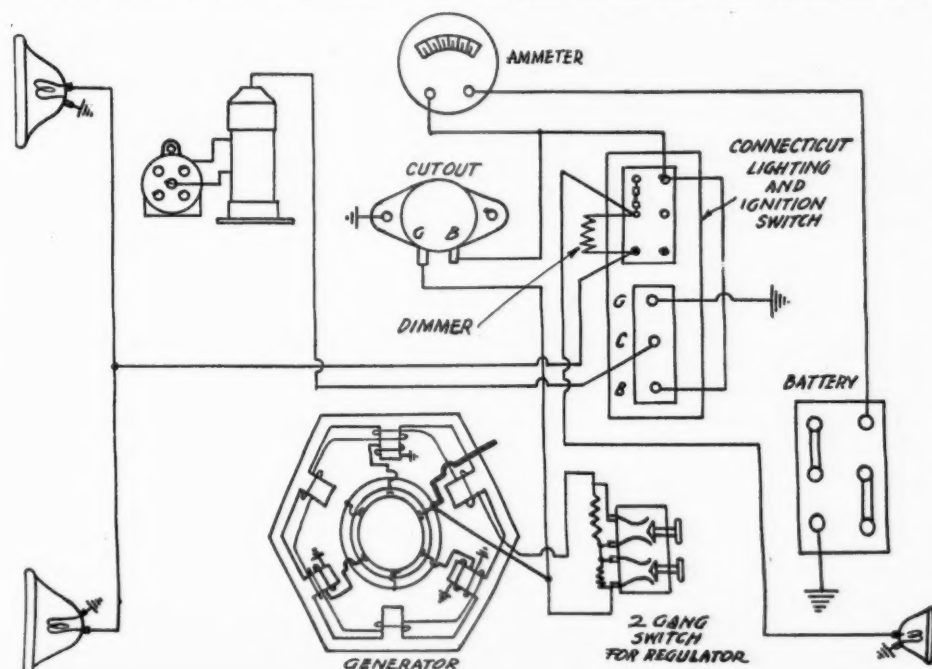
sufficient resistance is placed in the charging circuit to prevent too much current going to the battery. In the figure you will note that the system as shown has a different lighting and ignition switch but this need not enter into your problem whatever. You may use the original Maxwell voltage regulator and cutout and the original Maxwell ignition and lighting switch. The changes that you will make in the system however, are shown in the view marked "generator" and the special resistance wire and switch which are marked "two gang switch for regulation."

The switch of the two gang type for regulation has iron wire resistance coils

mounted on the back. The object of this is to have resistance which can be thrown in series with the field windings at medium and high speed so that the battery will not be overcharged. The movement of these buttons of course must be done manually and will not be automatic. The reading on the ammeter will determine when the buttons should be moved to decrease the charging rate.

Referring to the diagram it will be seen that connection from the brushes out through this regulating switch is completed back to the field winding when the buttons are pushed in as this shorts out the resistance coil and does not add any extra resistance. As the car speed increases and the ammeter indication becomes too great the lower button can be pulled out which will throw a certain amount of resistance into the circuit. Then when the current again increases too much the lower button can be pushed in and the upper one pulled out and at extremely high speed both buttons can be pulled out.

If the regulation is not sufficient with both buttons out it will be necessary to try coils made with smaller wire or else with a greater length of wire. The length of wire in the upper coil should be twice that in the lower coil for best regulation with greatest variety of possible regulating conditions.



WIRING OF 1917 MAXWELL FOR GENERATING ONLY USING SPECIAL UNITS \*100829

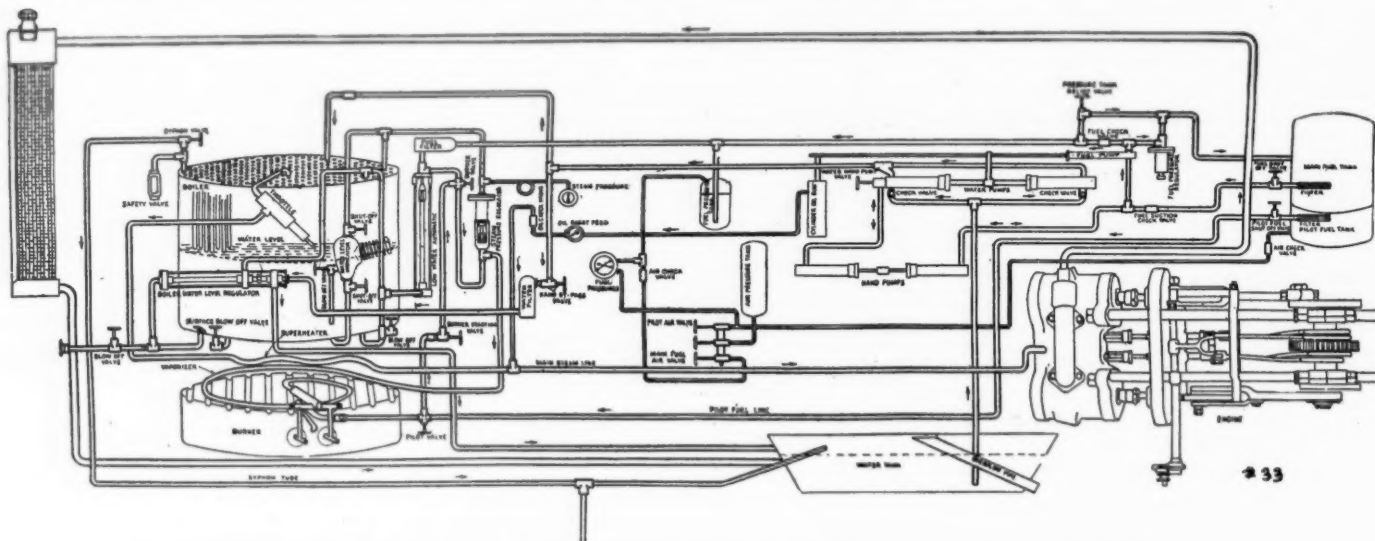
This Week:  
**"APPLYING THE FLAT  
 RATE SCHEDULES"**  
 and additional schedules on front  
 axles and steering gears.  
 Page 16.



## How a Spark Supplies Ignition on the Doble Steam Car

*Automotive Industries*  
March 15, 1923

### STANLEY STEAMER



Q—How does the Doble steam car light kerosene by an electric spark?—A. W. Stewart, Cable, Ohio.

Ignition of the kerosene is accomplished by means of using three pounds pressure on the kerosene which is conducted through a venturi. An electric

blower is brought into action as soon as the ignition switch is depressed and this supplies the pressure. The action of the venturi serves to impart velocity to the kerosene thus vaporizing it and enabling the electric spark to ignite it.

2—Can you furnish me drawing of Doble and Stanley steam boilers and their

system of burners?

2—Illustration of the Stanley boiler with piping is shown. We have an illustration of the old model Doble but we understand that this has since been changed considerably and we are therefore omitting it.

### CRANKSHAFT END PLAY WILL CAUSE A KNOCK

Q—We have here a Studebaker special six that has not run over 3000 miles but has a disagreeable knock in engine. It is worse at 25 m.p.h. and faster and sounds very much like a loose connecting rod. It can be heard when idling as well as when pulling. If No. 6 plug is shorted with a screwdriver the noise will stop at once, while shorting any of the other plugs does not affect it in the least. To drive fast with No. 6 spark plug wire disconnected there will be sort of a dull thud in motor when going fast instead of the sharper knock as with it connected.

Sometime ago the rear main bearing was tightened and the noise seemed to disappear for some time but came back again after a while. Again the bearings were looked too, the mains seemed very slightly loose. These were tightened. The connecting rods were tight so would stand no more tightening. The pistons were all removed and examined but nothing could be found wrong. The piston pins and bushings were O. K., and the connecting rods tested all right for alignment. The flywheel was tight and everything apparently O. K. There was perhaps  $\frac{3}{8}$  inch end play in crankshaft.

After putting together again it seemed to knock worse than before, until the bearings were loosened somewhat, and in No. 6 as before.—Millbrook Garage, Millbrook, Ill.

1—One-eighth of an inch end play in the crankshaft is excessive and will give rise to a very elusive knock. As the first step in eliminating the noise we would advise that you eliminate this end play and set the shaft up so that it will have not to exceed .005 end play. When this is done try the engine and see if the noise is still present, if so, remove the

piston and micrometer the cylinder at about 10 different positions on the bore.

It is possible that there is a ridge in the cylinder either at the top or bottom or at the center which gives the bore a smaller diameter at that point and allows the piston to pivot. This condition gives rise to what is commonly known as a piston slap. When you have micrometered the cylinder and made sure that it is circular and of the same diameter top, bottom and center, micrometer the piston to find out the amount of clearance between the piston skirt and the cylinder. The diametral clearance should not exceed .004 of an inch.

Incidental to checking the pistons we would also suggest that you be very careful to see that the shims in the connecting rods are not interfering with the bearing journal. 1923 and 24 Studebakers have the connecting rod bolts placed very close to the crankshaft journal and if a homemade or improperly cut shim is installed, they sometimes will catch between the bushing and the journal, allowing the rod to be loose at certain points of its rotation. Check this point very carefully and make sure that all shims are free and clear from the bushing and shaft.

2—We are attaching to this sheet a letterhead of a company which recently sent us some very attractive prices on denatured alcohol. They quoted these prices per wine gallon. Is that a smaller gallon than the usual gallon we use? Could you advise us as to the reliability of this company. They claim this to be 180 per cent completely denatured alcohol, formula No. 5. These are the same speci-

fications as we have been using from another company which has it priced about 8 cents per gallon higher.

2—The regular U. S. gallon used in common liquid measure contains four quarts and the apothecary or wine measure gallon contains 6 pints and 13 fluid ounces. There are 128 fluid ounces to a gallon so you can readily see that a wine gallon is considerably smaller in volume than the regular liquid gallon.

### HOW SOME OF THE CAR BUILDERS FINISH THEIR CYLINDERS

Q—How do the following factories finish their cylinder block bores? That is, are they reamed, ground or honed and in each case what make of reaming, grinding or honing tool is used. Packard, Hupmobile, Paige, Reo, Nash, Rickenbacker, Stutz, Continental and Weidely.—Motor Specialty Company, Boulder, Colo.

The following firms listed in your letter grind their cylinders at the factory: Packard, Hupmobile, Reo, Stutz, Continental and Weidely. The Nash engines are reamed, after a boring operation which is done on a large multiple boring machine. We have no data on the Rickenbacker or Paige, and therefore are unable to answer your question. The firms that grind their cylinders use different makes of machines; some factories having a certain number of one make and a certain number of other makes of grinders. Generally the machines used for grinding are divided among the following Landis, Wayne, Heald and Micro.

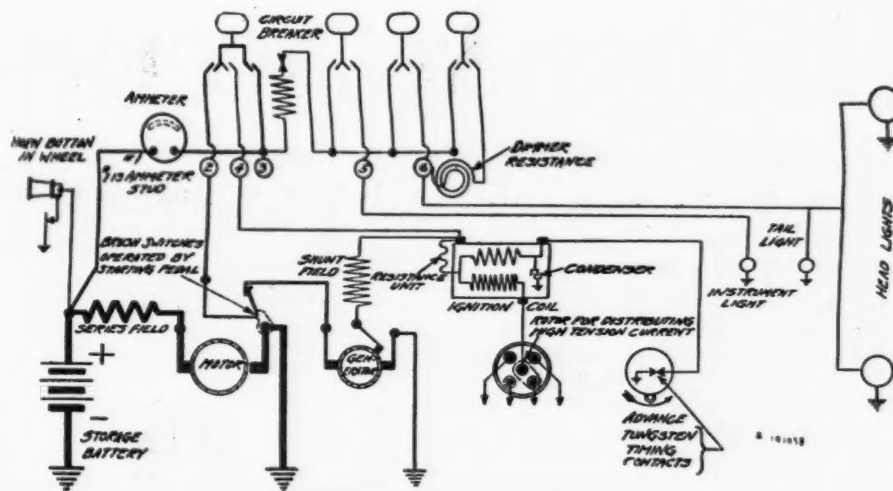
## A Case Where Heavy Discharge Current Is O. K.

Q—We have an Oakland 6 about 1917 or '19 model, which shows 20 amperes discharge when the ignition switch is turned on. We cannot locate the cause of the trouble, although when one of the generator brushes is lifted the current goes back to normal. When we press on the starting switch the current goes back to zero. Where is the cutout on this system? What is the purpose of the cutout on the back of the switch? Give wiring diagram, also diagram of generator and circuits and remedy for this condition.—Marrowbone Garage, Marrowbone, Ky.

We are showing a wiring diagram of the Oakland car model 38. The condition you describe is normal on a system of this kind where the ignition switch not only connects battery to the ignition coil but also to the generator. The heavy discharge current is due to the battery current flowing through the generator winding for, on the model in question, where you notice this condition there is no slipping clutch to allow the generator to run as a motor.

The 20 ampere discharge is therefore normal and when the engine starts the discharge should rapidly come over to zero and then the ammeter hand should continue to go to the charge side of the scale. There is no cutout used on this system and what you thought was a cut-out on the back of the switch is the circuit breaker which is carrying the current for the lights.

You state that when you operate the starter switch that the current goes back to zero. You did not state whether the starter worked or not. If the starter works and the engine fires the current should go to zero and keep on going, becoming a charging current. If on pressing the starter switch the starter does not operate and the current goes to zero it would indicate a possible corroded terminal at the battery or a poor battery ground connection at the frame of the car.



Wiring of 1917 Oakland Six

## RAISING CHARGING RATE OF SPLITDORF GENERATOR ON MITCHELL

Q—Send information as to raising the output of a model RGU 1 No. M20885 Splitdorf generator, used on Mitchell. This machine seems to be in perfect condition but only charges 4 amperes.

The generator current regulation on the Splitdorf model GU 4 generator is by vibrating regulator. The relay and regulator are combined in one unit. Remove the cover housing of the regulator and increase the spring tension on the vibrating regulator. You will find two sets of contact points in the regulator housing, one set being open when the engine is not running, and the other closed normally when the engine is stopped. Do not make any adjustments on the set of points which are open when the engine is not running, but make adjustments on the set that is closed.

If increasing the spring tension on this regulator does not increase the output, it would indicate trouble in the armature field, probably in the armature, and should this be the case, communicate with this office and we shall be pleased to offer further diagnosis.

2—Give information for adjusting the front main bearing of Studebaker 6, 1917.

2—There is nothing peculiar about adjusting the front main bearing on the Studebaker 1917 engine. It is only necessary to follow the same procedure as you would on the adjusting of a main bearing on any other engine. Information concerning bearing fitting has been published in MOTOR AGE from time to time, and we are enclosing a reprint of an article on bearing fitting.

3—Give us the name of a company that can furnish .030 oversize piston pins for this Mitchell No. 102921.—Service Garage, Wapanucka, Okla.

3—This will be answered by special letter.

## WHERE A RUBBER BAND HELPS THE ELECTRICAL MAN

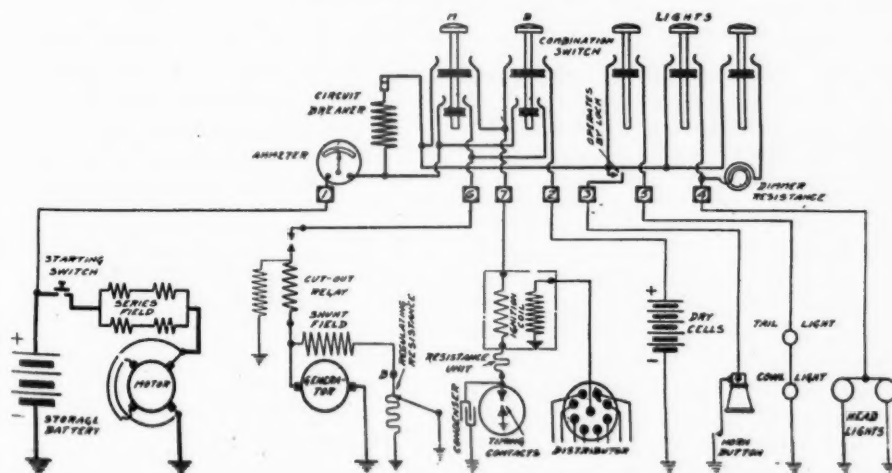
Q—Since last writing to you I have tried out an idea that might be of some benefit to the readers of MOTOR AGE. We were having difficulty in getting the end plate of the Delco motor generator outfit on Buick cars in place over the roller bearing, so we got in touch with the company and they advised us to try using a rubber band over the rollers to hold them in toward the center.

This we did and find it works out very successfully. The rubber band is permitted to remain with the bearing, as it does no harm. It was astonishing how easily it allowed the end to go together, after the hard fight we had previously had. We tried to do the same thing by using ordinary thread but it would not hold the rollers in close enough.—D. A. Innes, Brandon, Man., Canada.

MOTOR AGE readers having similar work to do will be glad no doubt to hear of this simple method of assembling the roller bearing in place. It at first occurred to us that it might not be advisable to leave the rubber band in place, but on investigation we find that the rubber band soon goes to pieces and apparently does no harm.

Another possible way of accomplishing the same thing is to pack the roller bearing in very hard grease, which holds the rollers in toward the center of the shaft so that the assembly can be easily made. Of course the grease has to be pretty hard in order to hold the rollers together.

## Wiring of 1916 Cole 8



Q—Send us a wiring diagram for a Cole 8, 1916. The number on the plate under the right hand front seat is 28742.

—Joe. Brown & Sons, Henderson, Ky.

Diagram is shown in accordance with your request.



# BOOSTING ACCESSORY SALES

CHRISTMAS shopping days have dwindled down to just a few, now, but you still have a chance to get in on some of the business, if you have not already done so. It is not too late, for instance, to put in a little Christmas display, if you do nothing more than buy and decorate a Christmas tree for your window or show room and tone the lights down with red and green bulbs. This, with your Christmas greeting cards which you are already sending to your customers, will remind them that you are still at their service.

But to pass up the holiday season without some special effort to attract attention to your establishment, is fatal. Every other line of business goes deeply into its advertising appropriation at Christmas time and spends plenty of money in dressing its windows and show space. The result of all this is that people buy there. If the garage or automotive sales place lets this opportunity slip by, people pass it up with, "They have no suitable gifts there."

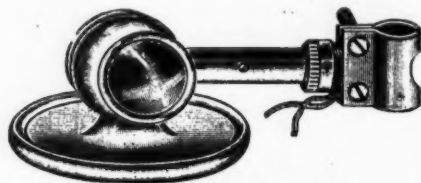
Make a list of the accessories that you have in stock and put the list in the window as a last minute gift suggestion. Put the price up with them and see if it won't help you move your stock so that you can have clean bins for the New Year inventory. Winter enclosures make fine gifts for the man who owns an open car.

The Rimplex second spare tire carrier was designed to meet the demand for a second tire carrier for the Ford, Star, Chevrolet, Gray and all cars where there is a license plate and tail light interference. It is a compact and completely assembled unit, easily installed and removed. It keeps the tires separated, is neat in appearance and rigid in construction. It is sold in sets of two and three by the Tripp-Secord Co., Detroit, Mich.

The Ace Combination Signal, Tail Lamp and License Bracket is fitted with a powerful bulb and reflector which attracts attention even in the strongest sunlight. The green lens stands out in sharp contrast to the numerous red tail lights on the street and is lighted by the slightest pressure of the foot brake. It sells, complete for \$6. Arthur M. Newhouse, 58 W. Washington street, Chicago, is the agent.

The Leuckert Lamp and Mirror is made in two models, the windshield type and hood type. The windshield type is made of brass and highly polished nickel. When driving the car, the mirror is set at any angle desired and when parking all that is necessary is to turn mirror down (as shown in the cut) and the light for parking is automatically lighted by a switch entirely hidden from view in the bracket arm.

The fender model is similar to the windshield model except that the mirror is turned toward the hood, when parking, to light the lamp. The price of the Mirrorlamp, including all fittings, is \$6.



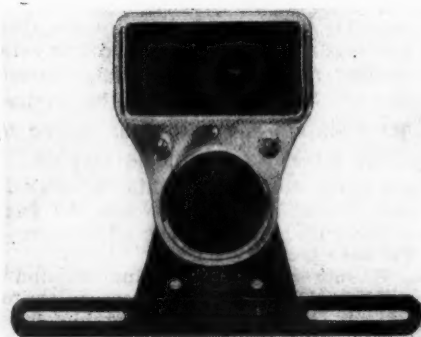
*Leuckert lamp and mirror*



*Rimplex second spare tire carrier*



*Culver-Stearns switch*



*Ace signal, lamp and license bracket*

It is made by the Leuckert Lamp Corp., 1834 Broadway, New York.

The Hi-Lab Leather Fan Belts are made by the Hide Leather & Belting Co., Indianapolis, Ind., for all makes of cars.

To provide a switch which can be installed without cutting a large hole in the dash, the Culver Stearns Mfg. Co. has brought out their G-550 and G-570 models. The switch mechanism is exactly the same as the standard push and pull switch, the button and finishing nut are of brass. Arthur M. Newhouse, 58 W. Washington street, Chicago.

Decker Enclosures are made for Buick, Chevrolet, Dodge, Hupmobile, Jewett, Paige, Maxwell, Studebaker, and Willys-Knight touring cars and sport models. The Decker is not a permanent top type of enclosure but utilizes the top already on the car, the glass sides of the Decker, fitting flush with the body of the car, both inside and out and maintaining the graceful lines of the car. It sells at \$85 at Detroit and is made by the Decker Mfg. Co., 255 Meldrum, Detroit.



*Glassmobile for Ford*



*Frisk auto caddy*



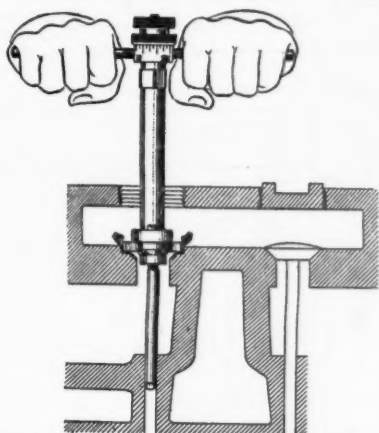
*Decker enclosure*

Glassmobile is made for all cars, the cut illustrating the Glassmobile for the Ford car. It is a series of curtains, with glass lights, fitting tightly to the car. A pocket for the rear compartment is provided where the Glassmobile may be kept, ready for use at any time, winter or summer. It sells at \$59, Glassmobile Co., 685 Canfield street, Detroit, Mich.

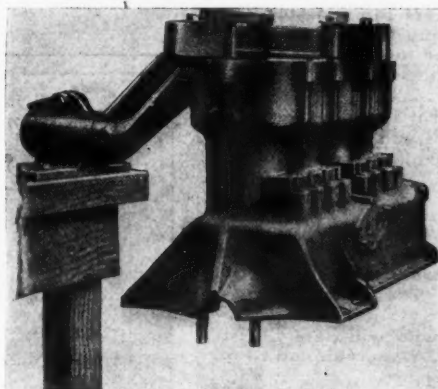
The Frisk Auto Caddy is a golf bag container to be attached to the running-board of the car. It puts the clubs out of the way and a cover is provided which protects the contents from the weather. A lock is also furnished. The Auto Caddy can be attached or detached from the runningboard in a few minutes. It is made by Thos. E. Wilson Co., 2037 Powell avenue, Chicago, and sells at \$25.

Do not neglect, at this time, to do a little planning for spring accessory business. Remember that there will be plenty of work to be done in canvassing your community both for accessory and new car sales. Newspaper ads and circular letters should get more than a little of your attention right after Christmas.

# GETTING MORE OUT of the SHOP



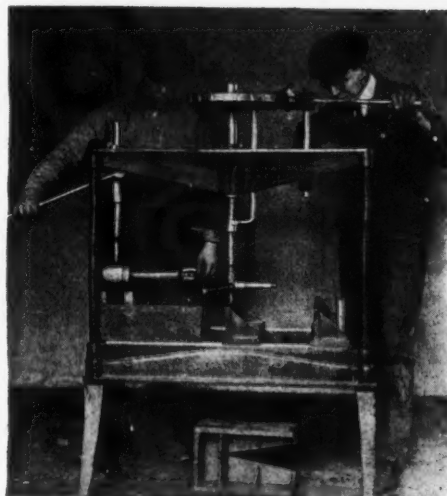
Lipe adjustable valve seat counterbore



O'Brien engine support



Gemco motor lift



Whitney arbor press

**I**MMEDIATELY following the holidays is a good time to install all of the new equipment which you have had in mind to take care of the rush in the spring. Surely there are many improvements which you want to make—many things that you noticed last summer that were not going just right and were delaying the work. Old fashioned tools, perhaps, or the system of routing work—these must have your attention because if anything, next summer and spring are going to tax your shop to a greater extent than ever before and you want to make money.

You will be able to do more work with greater efficiency if your shop is equipped and systematized to handle it. Remember that a service job is nothing more than another sales talk for the car you are selling and if you can do it good, you have that much less resistance to meet when you come to making another new car sale to the customer.

Surety Powdered Hand Soap is especially prepared for mechanics, motorists, and chauffeurs and removes grease, oil, paint, stains, rubber cement, putty and enamels. It is made by the Surety Mfg. Co., 26 W. Washington street, Chicago.

The Number Three Whitney Arbor Press is of the ratchet, quick action type of construction, the screw being raised or lowered by the wheel or by the lever when actual pressure is needed.

Entrance of complete car wheels without the removal of the tires is possible due to the distance between uprights, this feature is also appreciated in handling other bulky work such as front or rear axle units.

The rack and pinion press, as pictured at the left of the main screw, is also a feature of importance and is appreciated especially in wrist pin, bearing and bushing work. Operation of this press does not interfere with the heavier work of the main screw.

No. 3 Press, Type "A", complete with Ratchet Wheel Feed and Rack and Pinion Press, \$155.00. Type "B", Without Rack and Pinion Press \$125.00. Type "C", Without Rack and Pinion Press and not including Ratchet Wheel Feed, screw movement being controlled by bar in screw head, \$100.00. Rear Axle Press Attachment for any type press, additional, \$8.50. Manufactured by The R. S. Whitney Mfg. Co., Lewiston, Me.

The Lipe Adjustable Valve Seat Counterbore is fundamentally a counterbore that enables the mechanic to maintain the desired width of the cylinder block valve seat. The tendency today is towards narrow valve seats but repeated grinding of the valves and continued refacing with certain style reamers increases the width each time used. The remedy is to counterbore the top of the valve port and then establish a new seat with the regular angle reamer.

The Lipe Counterborer carries tool steel cutting bits which are mounted in guides at the bottom of the outside shell. These cutting bits are movable within the guides and have a range of diameter from 1 3/8 in. to 2 5/8 in. inclusive. Control of the diameter adjustment is by the knurled nut on top which is graduated in fractions of an inch. Adjustment is possible without removing the tool from the valve port. This means that the tool can be inserted in a solid head cylinder block and the cutters adjusted to a diameter as large or larger than the port plug diameter. The width of seat is controlled entirely by the diameter to which the cutters are extended. The use of the tool, according to the makers, will not change the angle of the valve seat or throw it out of alignment.

The cutter blades are easily removed and can be resharpened at any shop equipped with a power driven emery wheel. The tool comes complete with three pilot rods of 3/8, 1/2, and 5/8 in. diameter packed in carton with directions for regrounding cutter. Price \$10, net, and is made by the R. N. Roach Co., Rialto Bldg., San Francisco, Cal.

The O'Brien Automobile Engine Support is the product of the Banner Accessory Mfg. Co., 2629 LaSalle street, St. Louis. It is attached to the table or work bench as shown in the cut and the engine block when installed in it, can be placed in position for any operation. It sells at \$18, net.

The Gemco Motor Lift is made in two sizes, a heavy size for 8 and 12 cylinder engines and a lighter size for lighter cars and trucks. The lift is made of an electrically welded ring with three pieces of electrically welded chain attached to it, two long and one short. By adjusting these, sliding them over on the ring and attaching the long and the short to the right places, the motor can be perfectly balanced and lifted out easily.

The plates are to be attached to the nuts on the studs that hold the motor in place, but should the head be removed before the motor is lifted, sufficient washers or large nuts should be used so as to hold the steel terminal plate down tight to the motor so there is no chance of injuring the studs. The Gemco is the product of the Gemco Mfg. Co., Milwaukee, Wis.



# SQUEEKS & RATTLES

**S**ANTA CLAUS has hocked his reindeers for a motor car, all right and many a youngster is going to be greatly disappointed Christmas morning when he awakes to find that the old fellow didn't leave the car for him.

It's going to be hard on Santa this year if it's cold—the radiator might freeze before he makes the rounds and if the car is an old model, many a dealer will sit up all night waiting for him to see if he can't sell him a new one.

But the wide-awake dealers have already sold "Santa" his car or at least, they have sold him a winter top and a few more things which will make it easier for him when he "makes the rounds".

There are still a lot of dealers, though, who will pass Christmas eve, trying to kid themselves by saying, "Aw, yuh can't fool me—there ain't no Santa Claus."

## Fable

Once a guy drove through Zion, Ill., without breaking the law.

## Not a Fable

No one does so good a job at making both ends meet as Father Time does with the years—no sooner do you get through worrying about how you are going to pay 1923's bills than 1924 awamps you for attention.

## In the Winter

His nose is red,  
His cheeks are, too,  
When a guy fixes  
A tire which has blew.

## For Lots of Us

"I saw a book at the sporting goods store that was especially written for you."  
"What was it?"  
"Dumb Bell Exercises."

## Complete Equipment

WANTED—AN EXPERIENCED Aviator to train me to handle plane. State terms in first letter. I furnish plane, field and fool. B. G. Tharington, Creek, N. C.—Want ad. in the Raleigh (N. C.) News and Observer.

Small son of mechanic, on seeing his first electric storm, "Daddy, is this one of those leakin' electro fogs?"

## Christmas Rhyme

Christmas comes but once a year,  
When it comes, it leaves us broke.

## Take Off the Wheels

Clearing House inquirer says, "My car vibrates from 25 to 30 miles per hour. What can I do to increase this?"

## Capital, N-E-R-V-E

He wanted to get a Ford tire and was offered one of standard make for \$7.95. He said the price was 'way too high, and added: "Perhaps you can lend me one from a used car for a few days until I can get one of the \$5 ones from a mail order house."—Hap's Brother.

## Things That Never Happen



## What's Wrong Here?



Answer at the bottom of this column.

## On His Feet

A car salesman recently started on a canvass of his territory and, coming upon a colored lady, asked, "Has your husband an automobile, madam?"

"That critter ain't got anythin'," the lady replied, "an' besides I don't want no moto' ca' which he can be runnin' around in while I sits at home and mends the tires, same as I does with his socks."

## The Real Worry

I never stop to ponder,  
As to whether we,  
Have ancestral monkeys  
On our family tree.  
But I'm always striving,  
As the swift years pass,  
To live so that the future,  
Won't think that I'm an ass

—Oil Pull.

## In a Show Room

"What's the price of this car?"  
"Nine hundred dollars."  
"What does that include?"  
"Everything you see."  
"All right. When will you move out?"

## Weakly Korexpondens

editur squeex & ratels  
deer lew  
kan yu tel me about a gud cheep shok ex-  
orber? ther ot to be prety gud sail fer them  
as buter has gon down to 14c a lb an a rite  
smart lot of sekin han cherns is fer sail sens  
the farmers kommenst bringin ther milk to  
town in ther frods  
yrs  
axel stand

Olaf says, "Making maintenance pay is one thing, collecting the pay, another."

## A Howl for Help

Help!

Help!

## Answer to "What's Wrong Here?"

This salesman is not caught up on ladies' fashions or he would know and explain to the lady that hats are not being worn with closed cars this season—spare tires and bumpers being much more fashionable. Or, if she must, she can get seat covers in any shade to match any color or combination of colors.

LEW BRICATION.

## Current Motor Truck Specifications

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear
Acme.....20	1-1/2	34-1	Co-N.....3 1/2x5	B&B	Cot.....Ti-6250	WO.....34x5n	34x5n			
Acme.....30	1-1/2	34-1	Co-J4.....3 1/2x5	B&B	Cot.....Ti-6352	WO.....34x3 1/2	34x5			
Acme.....40	1-1/2	34-1	Co-J4.....3 1/2x5	B&B	Cot.....Ti-6460	WO.....34x3 1/2	34x5			
Acme.....60	2-1/2	34-1	Co-K4.....4 1/2x5 1/2	B&B	Cot.....Ti-6580	WO.....36x4	36x7			
Acme.....90	3-1/2	34-1	Co-L4.....4 1/2x5 1/2	B&B	Cot.....Ti-6660	WO.....36x5	40x10			
Acme.....125	3-1/2	34-1	Co-B5.....4 1/2x5 1/2	B&B	Cot.....Ti-6760	WO.....36x6	40x12			
Amer. La France.....2 1/2	1-1/2	3350	Ow.....4 1/2x5	Ow.....Ow.....DR.....36x4	36x7					
Amer. La France.....2 1/2	1-1/2	4950	Ow.....4 1/2x5	Ow.....Ow.....DR.....36x5	36x5					
Amer. La France.....2 1/2	1-1/2	5500	Ow.....4 1/2x5	Ow.....Ow.....DR.....36x6	40x8					
Armleder.....21	1-1/2	4275b	Bu-GTU.....4 1/2x5 1/2	Ful.....B-L.....Ti-6460	WO.....34x3 1/2	34x6k				
Armleder.....H2B	1-1/2	4275b	Bu-HTU.....4 1/2x5 1/2	B-L.....B-L.....Ti-6560	WO.....36x4k	36x4dk				
Armleder.....HWC	1-1/2	4275b	Co-C4.....4 1/2x5 1/2	B-L.....B-L.....Ti-6560	WO.....36x4k	36x4dk				
Armleder.....KWB	1-1/2	4275b	Bu-YTU.....4 1/2x5 1/2	B-L.....B-L.....Ti-6666	WO.....36x5k	36x5dk				
Armleder.....KWC	1-1/2	4275b	Co-E4.....4 1/2x5 1/2	Ful.....B-L.....Ti-6666	WO.....36x5k	36x5dk				
Atterbury.....20R	1-1/2	2475	Co-J4.....3 1/2x5	Ful.....B-L.....Ti-6460	WO.....34x4k	34x6k				
Atterbury.....22C	1-1/2	3375b	Co-K4.....4 1/2x5 1/2	B-L.....B-L.....Ti-6560	WO.....36x4k	36x4d				
Atterbury.....24	1-1/2	4275b	Co-L4.....4 1/2x5 1/2	B-L.....B-L.....Ti-6660	WO.....36x5	40x8				
Atterbury.....8E	1-1/2	4975b	Co-B2.....4 1/2x5 1/2	B-L.....B-L.....Ti-6760	WO.....36x6	40x7d				
Autocar.....21	1-1/2	2200	Ow.....4 1/2x5 1/2	Ow.....Ow.....DR.....34x4	34x6					
Autocar.....21-2	1-1/2	3450	Ow.....4 1/2x5 1/2	Ow.....Ow.....DR.....34x5	36x8					
Autocar.....26	1-1/2	4650	Ow.....4 1/2x5 1/2	Ow.....Ow.....DR.....34x6	36x12					
Available.....H1	1-1/2	2450	He-O.....4x5	B-L.....B-L.....Ti-6560	WO.....36x3 1/2	36x8				
Available.....H2	1-1/2	3160	He-O.....4x5	B-L.....B-L.....Ti-6560	WO.....36x5	40x5d				
Available.....H3	1-1/2	4175	He-MU3.....4 1/2x5 1/2	B-L.....B-L.....Ti-6666	WO.....36x6	40x12				
Available.....H5	1-1/2	5375	He-T3.....5x6	B-L.....B-L.....Ti-6760	WO.....36x6	40x12				
Avery.....1-1/2	1-1/2	4975b	Ow.....3x4	Ow.....Ow.....To-0X2	IG.....34x5n	34x5n				
Bessemer.....G1	1-1/2	1450	Co-N.....3 1/2x5	Ful.....To-A.....IG.....35x5n	35x5n					
Bessemer.....H2	1-1/2	1995	Co-N.....3 1/2x5	B&B.....LM-7150	DR.....36x3 1/2	36x5				
Bessemer.....J2	1-1/2	2895	Co-C2.....4 1/2x5 1/2	B&B.....B-L.....LM-7250	DR.....36x4	36x4d				
Bessemer.....K2	1-1/2	3495	Co-E7.....4 1/2x5 1/2	B-L.....To-B.....IG.....36x5	36x10					
Bethlehem.....KN1	1-1/2	1385	Ow.....3 1/2x5	B&B.....Det.....Ea-1000	SB.....35x5n	35x5n				
Bethlehem.....GN2	1-1/2	2185	Ow.....4 1/2x5 1/2	B&B.....Det.....Wi-60A	DR.....34x4	34x6				
Bethlehem.....HN2	1-1/2	2985	Ow.....4 1/2x5 1/2	Ful.....Wi-85E	DR.....34x4	36x8				
Brockway.....E2	1-1/2	1775	Wi-SU.....4x5	B-L.....B-L.....Ti-6460	WO.....36x4	36x8				
Brockway.....S1	1-1/2	1775	Wi-SU.....4x5	B-L.....B-L.....Ti-6460	WO.....36x4	36x8				
Brockway.....K2	1-1/2	1775	Co-K4.....4 1/2x5 1/2	B-L.....B-L.....Ti-6560	WO.....36x4	36x8				
Brockway.....R3	1-1/2	1775	Co-L4.....4 1/2x5 1/2	B-L.....B-L.....Ti-6660	WO.....36x5	36x5d				
Brockway.....T5	1-1/2	1775	Co-B5.....4 1/2x5 1/2	B-L.....B-L.....Ti-6760	WO.....36x6	40x7d				
Buick.....23-4-SD	1-1/2	945	Ow.....3 1/2x4 1/2	Ow.....Ow.....SB.....31x4n	31x4n					
Case.....TR2	1-1/2	395	Ow.....4 1/2x5 1/2	TD.....Ow.....To-C139	IG.....36x6n	36x7n				
Chevrolet.....Supr	1-1/2	395	Ow.....3 1/2x4	Ow.....Ow.....SB.....30x3 1/2	30x3 1/2					
Chevrolet.....Utd	1-1/2	550	Ow.....3 1/2x4	Ow.....Mun.....SB.....31x4n	34x1 1/2					
Clinton.....20	1-1/2	1980	Bu-WTU.....3 1/2x5 1/2	B-L.....B-L.....Ti-6250	WO.....34x5n	34x5n				
Clinton.....45	1-1/2	2810	Bu-GTU.....3 1/2x5 1/2	B-L.....B-L.....Ti-6460	WO.....34x4 1/2	34x4 1/2				
Clinton.....65	1-1/2	3480	Bu-ETU.....3 1/2x5 1/2	B-L.....B-L.....Ti-6660	WO.....36x6	36x6d				
Clinton.....90	1-1/2	4160	Bu-YTU.....3 1/2x5 1/2	B-L.....B-L.....Ti-6660	WO.....36x6	36x7d				
Clinton.....120	1-1/2	4890	Bu-BTU.....3 1/2x5 1/2	B-L.....B-L.....Ti-6760	WO.....36x6	36x7d				
Clydesdale.....10A	1-1/2	1785	Co-N.....3 1/2x5	B&B.....B-L.....Ti-6250	SB.....34x5n	34x5n				
Clydesdale.....8	1-1/2	2650	Co-K4.....4 1/2x5 1/2	B-L.....B-L.....Ti-6460	WO.....36x4	36x7				
Clydesdale.....6	1-1/2	3300	Co-L4.....4 1/2x5 1/2	B-L.....B-L.....Ti-6560	WO.....36x5	36x5d				
Clydesdale.....4	1-1/2	4200	Co-B5.....4 1/2x5 1/2	B-L.....B-L.....Ti-6666	WO.....36x6	40x6d				
Clydesdale.....2-6-7	1-1/2	4500	Co-B5.....4 1/2x5 1/2	B-L.....B-L.....Ti-6760	WO.....36x7	40x7d				
Commerce.....9-1/2-11-1/2	1-1/2	395	Co-N.....3 1/2x5	Det.....Det.....Sa-D16	SB.....33x5n	33x5n				
Commerce.....14	1-1/2	395	Co-J4.....3 1/2x5	B-L.....B-L.....Ti.....WO.....36x3 1/2	36x5k					
Commerce.....25	1-1/2	395	Co-K4.....4 1/2x5 1/2	B-L.....B-L.....Ti-6560	WO.....36x4k	36x7k				
Corbett.....S	1-1/2	395	HS-30.....3 1/2x5	B-L.....B-L.....Sh-1002	WO.....34x3 1/2	34x4 1/2				
Corbett.....E	1-1/2	395	Co-N.....3 1/2x5	B-L.....B-L.....Sh-1002	WO.....34x3 1/2	34x4 1/2				
Corbett.....D1	1-1/2	395	Co-J4.....3 1/2x5	B-L.....B-L.....Sh-1501	WO.....34x3 1/2	34x5k				
Corbett.....C2	1-1/2	395	Co-K4.....4 1/2x5 1/2	B-L.....B-L.....Sh-103	WO.....36x3 1/2	36x7k				
Corbett.....B2	1-1/2	395	Co-K4.....4 1/2x5 1/2	B-L.....B-L.....Sh-21	WO.....36x4k	36x8				
Corbett.....R3	1-1/2	395	Co-L4.....4 1/2x5 1/2	B-L.....B-L.....Sh-21	WO.....36x5	36x10				
Corbett.....A3-4	1-1/2	395	Co-B5.....4 1/2x5 1/2	B-L.....B-L.....Sh-51	WO.....36x6	40x12				
Corbett.....AA5	1-1/2	395	Bu-WTU.....3 1/2x5 1/2	B-L.....B-L.....Ti-6352	WO.....34x3 1/2	34x4				
Day-Elder.....AN	1-1/2	395	Co-J4.....3 1/2x5	B-L.....B-L.....Ti-6460	WO.....34x3 1/2	34x5				
Day-Elder.....BN2	1-1/2	395	Co-K4.....4 1/2x5 1/2	B-L.....B-L.....Ti-6560	WO.....36x4	36x7				
Day-Elder.....DN2	1-1/2	395	Bu-HTU.....4 1/2x5 1/2	B-L.....B-L.....Ti-6560	WO.....36x4	36x8				
Day-Elder.....CN3	1-1/2	395	Co-L4.....4 1/2x5 1/2	B-L.....B-L.....Ti-6666	WO.....36x5	36x5d				
Day-Elder.....FN1	1-1/2	395	Bu-YTU.....4 1/2x5 1/2	B-L.....B-L.....Ti-6760	WO.....36x6	40x6d				
Day-Elder.....EN5-6	1-1/2	395	Bu-Mu.....3 1/2x5 1/2	Ful.....Ful.....Wi.....WO.....35x5n	35x5n					
Dearborn.....E1	1-1/2	1800	Bu-WU.....3 1/2x5 1/2	Ful.....Ful.....Wi.....WO.....34x4 1/2	34x7					
Dearborn.....F1	1-1/2	1800	Co-N.....3 1/2x5	Ful.....Ful.....Cl-B300*	SB.....34x5n	34x5n				
Dearborn.....482	1-1/2	2390	Co-J4.....3 1/2x5	Ful.....Ful.....Cl-1D.....IG.....35x5n	36x7n					
Denby.....31-1/2-11-1/2	1-1/2	1485	Co-N.....3 1/2x5	Ful.....Ful.....Cl-2D.....IG.....36x4	36x8					
Denby.....332	1-1/2	2375	Co-L4.....4 1/2x5 1/2	Ful.....Ful.....Cl-3D.....IG.....36x5	36x5d					
Denby.....353	1-1/2	2975	Co-K4.....4 1/2x5 1/2	Ful.....Ful.....Cl-5D.....IG.....36x6	40x6d					
Denby.....271	1-1/2	3695	Co-B5.....4 1/2x5 1/2	Ful.....Ful.....Ru.....IG.....36x6	40x14					
Denby.....2105	1-1/2	4945	Co-B5.....4 1/2x5 1/2	Ful.....Ful.....Wi-800J.....WO.....34x5	34x5					
Dependable.....CD	1-1/2	2350	Bu-CTU.....3 1/2x5 1/2	Ful.....Ful.....Wi-600C.....WO.....36x5	36x10					
Dependable.....EG	1-1/2	2950	Bu-ETU.....3 1/2x5 1/2	Ful.....Ful.....Wi-600C.....WO.....36x5	36x10					
Diamond T.....75	1-1/2	395	He-O.....4x5	Cov.....Cov.....Co-32021	SB.....33x5n	33x5n				
Diamond T.....O3	1-1/2	395	Hi-700.....3 1/2x5 1/2	Cov.....Cov.....Ow.....WO.....36x3 1/2	36x4					
Diamond T.....T1	1-1/2	395	Hi-700.....3 1/2x5 1/2	Cov.....Cov.....Ti-6460	WO.....36x3 1/2	36x5				
Diamond T.....U2	1-1/2	395	Hi-1400.....4 1/2x5 1/2	Cov.....Cov.....Ti-6580	WO.....36x4k	36x8k				
Diamond T.....K3	1-1/2	395	Hi-1500.....4 1/2x5 1/2	Cov.....Cov.....Ti-6666	WO.....36x5	36x5d				
Diamond T.....EL5	1-1/2	395	Hi-200.....4 1/2x5 1/2	Cov.....Cov.....Ti-6760	WO.....36x6	40x6d				
Diamond T.....S5	1-1/2	395	Hi-B2.....4 1/2x5 1/2	B-L.....B-L.....Ti-6760	WO.....36x6	40x6d				
Dodge Brothers.....34	1-1/2	730	Ow.....3 1/2x4 1/2	Ow.....Ow.....SB.....32x4n	32x4n					

\*—Make Optional  
†—Short wheelbase model  
‡—6 cylinders  
§—All 4 cyl. engines unless otherwise specified  
||—Truck tractor  
¶—Front wheel drive  
⌘—price includes body or cab  
d—dual  
k—pneumatic tires optional at extra cost  
u—pneumatic tires standard

ENGINE:  
Bu—Buda  
Co—Continental  
Do—Dodge  
He—Hercules  
Hi—Hinkley  
HS—Hershey-Spillerman  
Ly—Lycoming  
MI—Midwest  
Wa—Waukesha  
We—Weideley  
Wi—Wisconsin

CLUTCH & GEARSET  
B&B—Borg & Beck  
B-L—Brown-Lipe  
Bak—Baker  
Cam—Campbell  
Cot—Cotta  
Cov—Covert  
Det—Detroit  
Det—Detroit  
Ful—Fuller  
H-S—Hole-Shaw  
Hoo—Hoosier  
M&E—Merchant & Evans

Mec—Mechanics  
Mun—Muncie  
T.D.—Twin Disc  
War—Warner  
REAR AXLE:  
Am—American  
Cl—Clark  
Co—Columbia  
Du—Duraton  
En—Eaton  
Fl—Flint  
LM—L-M

Ru—Russell  
Sa—Salsbury  
Sh—Sheldon  
Ti—Timken  
To—Torbenesen  
Wa—Walker  
Wi—Wisconsin  
Ch—Chain  
DR—Double Reduction  
IG—Internal Gear  
SB—Spiral Bevel  
SP—Straight Bevel  
WO—Worm



# Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear
Kissel	4	\$3625	Ow.	4 1/2 x 5 1/2	War.	War.	Sh-31	WO.	36x5	36x12
Larrabee	X2	1785	Co-SR	3 3/4 x 4 1/2	B-L	B-L	Sa-1480	SB.	34x5	34x5
Larrabee	J4	2400	Co-J4	3 3/4 x 5	B-L	B-L	Sh-1501	WO.	34x5 1/2	34x5 1/2
Larrabee	K5	3550	Co-L4	4 1/2 x 5 1/2	B-L	B-L	Sh-22	WO.	36x4	36x8
Larrabee	L4	4100	Co-L4	4 1/2 x 5 1/2	B-L	B-L	Sh-31	WO.	36x5	36x10
Maccar	EX	11 1/2	Wi-SU	4x5	B-L	B-L	Sa-1526e	SB.	34x5 1/2	34x5 1/2
Maccar	HT	11 1/2	Wi-TAU	4x6	B-L	B-L	Ti-6460	WO.	36x4	36x6
Maccar	HT2	11 1/2	Wi-TAU	4x6	B-L	B-L	Ti-6560	WO.	36x4	36x8
Maccar	H-13	11 1/2	Wi-TAU	4x6	B-L	B-L	Ti-6560	WO.	36x4	36x8
Maccar	M-24	11 1/2	Wi-TAU	4x6	B-L	B-L	Ti-6666	WO.	36x5	36x10
Maccar	G-15	11 1/2	Wi-TAU	4x6	B-L	B-L	Ti-6760	WO.	36x6	40x6
MacDonald	O-3	5500b	Bu-WTU	3 3/4 x 5 1/2	B-L	B-L	**Ow.	IG.	36x6	36x10
MacDonald	A-7 1/2	8000b	Bu-YTU	4 1/2 x 6	B-L	B-L	**Ow.	IG.	40x7	40x14
Mack	AB 1 1/2	3000	Ow.	4x5	Ow.	Ow.	Ow.	Ch.	36x3 1/2	36x3 1/2
Mack	AB 1 1/2	3150	Ow.	4x5	Ow.	Ow.	Ow.	Ch.	36x3 1/2	36x3 1/2
Mack	AB 2	3300	Ow.	4 1/2 x 5	Ow.	Ow.	Ow.	Ch.	36x4	36x4
Mack	AB 2 1/2	3750	Ow.	4 1/2 x 5	Ow.	Ow.	Ow.	Ch.	36x4	36x4
Mack	AB 2 1/2	3400	Ow.	4 1/2 x 5	Ow.	Ow.	Ow.	Ch.	36x4	36x4
Mack	AB 2 1/2	3850	Ow.	4 1/2 x 5	Ow.	Ow.	Ow.	Ch.	36x4	36x4
Mack	AC 3 1/2	4950	Ow.	5x8	Ow.	Ow.	Ow.	Ch.	36x5	40x5
Mack	AC 3 1/2	5500	Ow.	5x8	Ow.	Ow.	Ow.	Ch.	36x6	40x6
Mack	AC 6 1/2	5750	Ow.	5x8	Ow.	Ow.	Ow.	Ch.	36x6	40x12
Mack	AC 7 1/2	6000	Ow.	5x8	Ow.	Ow.	Ow.	Ch.	36x7	40x12
Mack	AB 5	3400	Ow.	4 1/2 x 5	Ow.	Ow.	Ow.	Ch.	36x4	36x4
Mack	AC 7	4950	Ow.	5x8	Ow.	Ow.	Ow.	Ch.	36x5	40x5
Mack	AC 10	5500	Ow.	5x8	Ow.	Ow.	Ow.	Ch.	36x6	40x6
Mack	AC 13	5750	Ow.	5x8	Ow.	Ow.	Ow.	Ch.	36x6	40x12
Mack	AC 15	6000	Ow.	5x8	Ow.	Ow.	Ow.	Ch.	36x6	40x12
Mason	11 1/2	1295	He.	4x5	Hoo.	War.	FL.	SB.	34x5 1/2	34x5 1/2
Master	21 1/2	11 1/2	Bu-WTU	3 3/4 x 5 1/2	Ful.	Ful.	Ti-5511	SB.	33x5 1/2	33x5 1/2
Master	41 1/2	11 1/2	Bu-UTU	4 1/2 x 6	Ful.	Ful.	Ti-6160	WO.	34x4	34x6
Master	51 1/2	11 1/2	Bu-UTU	4 1/2 x 6	B-L	B-L	Ti-6560	WO.	34x4	36x8
Master	61 1/2	11 1/2	Bu-YTU	4 1/2 x 6	B-L	B-L	Ti-6666	WO.	36x5	40x10
Master	61 1/2	11 1/2	Bu-YTU	4 1/2 x 6	B-L	B-L	Ti-6760	WO.	36x5	40x12
Master	64 1/2	11 1/2	Bu-ATU	4 1/2 x 6	B-L	B-L	Ti-6760	WO.	36x6	40x14
Maxwell	11 1/2	1097	Ow.	3 3/4 x 4 1/2	Ow.	Ow.	Ow.	Ch.	36x5 1/2	36x5 1/2
Menominee	B1	1650	Wi-SU	4x5	B&B	Det.	Co-5200	SB.	35x5 1/2	35x5 1/2
Menominee	HT 1 1/2	2000	Wi-CAU	3 3/4 x 5	Ful.	Det.	Wi-800G	WO.	34x3 1/2	36x5k
Menominee	H1 1/2	2175	Wi-CAU	4x5	Ful.	Det.	Wi-800H	WO.	34x3 1/2	36x5k
Menominee	D 2 1/2	2875	Wi-TAU	4x6	Ful.	Det.	Wi-800J	WO.	36x4	36x8
Menominee	J5	4850	Wi-RAU	4x6	B&B	Det.	Ti-6760	WO.	36x5	40x12
Moline	11 1/2	1095	Ow.	3 1/2 x 5	B&B	Ow.	To-A	IG.	34x5 1/2	36x6
Nash	2018	11 1/2	Ow.	3 1/2 x 5	B&B	Det.	CI-1D	IG.	34x4	34x6
Nash	4017	21 1/2	Bu-HU	4 1/2 x 5 1/2	B&B	Ow.	Ow.	IG.	36x6	36x6
Nash	3018	21 1/2	Ow.	3 1/2 x 5	B&B	Det.	CI-2D	IG.	34x4	34x6
Nash	5018	21 1/2	Ow.	3 1/2 x 5	B&B	Det.	CI-2D	IG.	34x4	34x6
Noble	A-7 1/2	1395	Bu-WTU	3 3/4 x 5 1/2	Ful.	Ful.	Sh-300	SB.	34x4 1/2	34x4 1/2
Noble	A-21 1/2	1890	Bu-WTU	3 3/4 x 5 1/2	Ful.	Ful.	Sh-1501	WO.	34x5	34x5
Noble	B-31 1/2	2695	Bu-CTU	3 3/4 x 5 1/2	Ful.	Ful.	Sh-103	WO.	36x7	36x7
Noble	D-51 1/2	3150	Bu-ETU	4 1/2 x 5 1/2	Ful.	Ful.	Sh-21	WO.	36x4	36x8
Noble	E-71 1/2	3850	Bu-YTU	4 1/2 x 6	Ful.	War.	Sh-30	WO.	36x5	36x10
Old Reliable	B 1 1/2	3500	Wi-CAU	4x6	Ful.	Ful.	Sh-21	WO.	34x4	36x8
Old Reliable	C 1 1/2	4250	Wi-CAU	4x6	Ful.	Ful.	Sh-31	WO.	36x5	36x12
Old Reliable	D 5	5000	Wi-RAU	4x6	Ow.	B-L	Sh-51	WO.	36x6	40x12
Old Reliable	K 1 1/2	6000	Wa-P	4x6 1/2	Ow.	Ow.	Ow.	Ch.	36x6	40x14
Oldsmobile	T 1	1095	Ow.	3 1/2 x 5	B&B	War.	To-OX2	IG.	35x5 1/2	35x5 1/2
Onida	B 1 1/2	2825	Hi-400	4x5 1/2	Ful.	Ful.	Wi-800J	WO.	36x3 1/2	36x7
Onida	C 2 1/2	3200	Hi-400	4x5 1/2	Ful.	Ful.	Wi-900C	WO.	36x5	36x10
Onida	D 3 1/2	4050	Hi-200	4 1/2 x 5 1/2	Ful.	Ful.	Ti-6652	WO.	36x5	36x10
Overland	91ce	395	Ow.	3 1/2 x 4	B&B	Ow.	Ow.	SB.	36x3 1/2	36x3 1/2
Patriot, Revere	1	1350	Co-N	3 1/2 x 5	B&B	Cov.	Ti-6250	WO.	35x5 1/2	35x5 1/2
Patriot, Lincoln	2	2400	Hi-100	4x5 1/2	Cov.	Ful.	Ti-6560	WO.	34x4k	34x4k
Pat., Washington	3	3000	Hi-200	4 1/2 x 5 1/2	Cov.	Cov.	Wi-900	WO.	36x5k	36x8k
Pierce Arrow	XA2	3300	Ow.	4x5 1/2	Ow.	Ow.	Ow.	WO.	36x4	36x8
Pierce Arrow	XB3	3500	Ow.	4x5 1/2	Ow.	Ow.	Ow.	WO.	36x5	36x8
Pierce Arrow	WC1	4600	Ow.	4 1/2 x 6 1/2	Ow.	Ow.	Ow.	WO.	36x5	36x8
Pierce Arrow	WD5	4700	Ow.	4 1/2 x 6 1/2	Ow.	Ow.	Ow.	WO.	36x6	36x7
Pierce Arrow	RE	5100	Ow.	4 1/2 x 6 1/2	Ow.	Ow.	Ow.	WO.	36x6	40x7
Pierce Arrow	RF 7 1/2	5200	Ow.	4 1/2 x 6 1/2	Ow.	Ow.	Ow.	WO.	36x6	40x8
Rainier	R31	11 1/2	Co-N	3 1/2 x 5	B-L	B-L	Ti-6250	WO.	35x5 1/2	35x5 1/2
Rainier	R29 1/2	11 1/2	Co-N	3 1/2 x 5	B-L	B-L	Ti-6250	WO.	34x3 1/2	34x3 1/2
Rainier	R36 1/2	11 1/2	Co-J4	3 3/4 x 5	B-L	B-L	Ti-6460	WO.	34x3 1/2	34x3 1/2
Rainier	R28 2 1/2	11 1/2	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Sh-103	WO.	34x4	36x7
Rainier	R29 2 1/2	11 1/2	Co-K4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.	36x5	36x8
Rainier	R25 3 1/2	11 1/2	Co-L4	4 1/2 x 5 1/2	B-L	B-L	Ti-6666	WO.	36x5	36x8
Rainier	R27 1/2	11 1/2	Co-B5	4 1/2 x 5 1/2	B-L	B-L	Ti-6760	WO.	36x6	40x6
Reo	F 1 1/2	1185	Ow.	3 1/2 x 4 1/2	Ow.	Ow.	Ow.	SB.	34x4 1/2	34x4 1/2
Reo	F 1 1/2	1485b	Ow.	3 1/2 x 4 1/2	Ow.	Ow.	Ow.	SB.	33x4 1/2	33x4 1/2
Republic	75 1 1/2	11 1/2	Wi-CT	3 3/4 x 5	Ful.	Ful.	To-750	IG.	33x5 1/2	33x5 1/2
Republic	11X2	11 1/2	Co-J1	3 3/4 x 5	Ful.	Ful.	To-CT2	IG.	34x4	34x6
Republic	19W3	11 1/2	Wa-FU	4x5 1/2	Ful.	Ful.	To-CT2	IG.	36x4	36x8
Republic	19	11 1/2	Co-K4	4 1/2 x 5 1/2	Ful.	Ful.	To-CT2	IG.	36x4	36x8
Republic	20 1/2	11 1/2	Co-L4	4 1/2 x 5 1/2	Ful.	Ful.	To-E	IG.	36x5	36x10
Rowe	CW 1 1/2	3000	Wi-CAU	3 3/4 x 5	B-L	B-L	Sh-1501	WO.	36x5 1/2	36x5 1/2
Rowe	CDW 2 1/2	3300	Wi-CAU	4x5	B-L	B-L	Sh-103	WO.	34x5	36x3 1/2
Rowe	GSW 1 1/2	4150	Wi-NU	4x5	B-L	B-L	Sh-21	WO.	34x5	36x8
Rowe	HW 1 1/2	4500	Wi-TAU	4x6	B-L	B-L	Sh-21	WO.	34x6	36x8
Rowe	FW 5	4850	Wi-VAU	4x6	B-L	B-L	Sh-51	WO.	36x7	40x6
Ruggles	15 1/2	895	HS.	3 1/2 x 5	M&E	Ful.	Co.	SB.	32x4 1/2	32x4 1/2
Ruggles	20R 1 1/2	1375	Ow.	3 1/2 x 5	B-L	B-L	Wi-65	DI.	34x5 1/2	34x5 1/2
Ruggles	40H 1 1/2	2095	Ow.	4x5	B-L	B-L	Wi-88 1/2	DR.	36x8	36x8
Ruggles	40H 1 1/2	2295	Ow.	4x5	B-L	B-L	Wi-88 1/2	DR.	36x8	36x8
Sandow	CG&G 1 1/2	1795	Co-N	3 1/2 x 5	Ful.	Ful.	Sh-1501	WO.	34x3 1/2	34x3 1/2
Sandow	J 2 1/2	2750	Co-C4	4 1/2 x 5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x7
Sandow	M 5	4325	Co-B5	4 1/2 x 5 1/2	B-L	B-L	Ti-6760	WO.	36x6	40x12
Sanford	10 1/2	11 1/2	Co-SR1	3 3/4 x 5 1/2	B&B	B-L	Sa-D	SB.	33x5 1/2	33x5 1/2
Sanford	15 1/2	11 1/2	Co-N	3 1/2 x 5	B-L	B-L	Sh-1501	WO.	36x3 1/2	36x5k
Sanford	25 2 1/2	11 1/2	Co-C4	4 1/2 x 5 1/2	B&B	B-L	Sh-21	WO.	36x4k	36x4k
Sanford	35 3 1/2	11 1/2	Co-E4	4 1/2 x 5 1/2	B&B	B-L	Sh-31	WO.	36x5	36x8
Sanford	50 5	11 1/2	Co-E4	4 1/						

## Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

## CANADIAN

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear				Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear
Goitredson...20	1/2-1	\$2275	Bu-WTU	3 3/4 x 5 1/2	B-L	B-L	Ti-6250	WO.	34x5n	34x5n	National...FA	1 1/2	\$2450	Wa-BUX	3 3/4 x 5 1/2	B-L	B-L	Ti-6352	WO.	35x5n	35x5n
Goitredson...40	1 1/2-2	3290	Bu-GTU	4 1/2 x 5 1/2	B-L	B-L	Ti-6400	WO.	36x6n	38x7n	National...GA	1 1/2	2750	Wa-BUX	3 3/4 x 5 1/2	B-L	B-L	Ti-6400	WO.	44x4k	34x6k
Goitredson...50	2 1/2-3	3775	Bu-EU	4 1/2 x 5 1/2	B-L	B-L	Ti-6500	WO.	38x4	36x8	National...HD	2 1/2	3750	Wa-CU	4 1/2 x 5 1/2	H-S	B-L	Ti-6500	WO.	36x5	36x10
Goitredson...80	4	4775	Bu-YTU	4 1/2 x 6	B-L	B-L	Ti-6600	WO.	34x5	36x12	National...NB	3 1/2	4750	Wa-DU	4 1/2 x 6	H-S	B-L	Ti-6600	WO.	36x6	36x12
Goitredson...100	5	5800	Bu-BTU	5 1/2 x 6	B-L	B-L	Ti-6700	WO.	36x6	40x14	National...OA	5	6150	Wa-EU	5 1/2 x 6	H-S	B-L	Ti-6700	WO.	36x6	40x14
Mapleleaf...11 1/2	1 1/2	3000	Hi-300	3 3/4 x 5 1/2	Ful.	Ful.	Sh-1501	WO.	34x5n	36x8n	Veteran...M	1 1/2	2899	Bu-CTU	3 3/4 x 5 1/2	B&B	Cot.	Sh-1501	WO.	34x5n	34x5n
Mapleleaf...AA	2	3600	Hi-400	4 1/2 x 5 1/2	Ful.	Ful.	Sh-103	WO.	36x4	36x7	Veteran...P	2	3699	Bu-HTU	4 1/2 x 5 1/2	B&B	Cot.	Sh-21	WO.	36x4	36x7
Mapleleaf...BB	3	4050	Hi-500	4 1/2 x 5 1/2	Ful.	Ful.	Sh-21	WO.	36x4	36x4d	Veteran...R	3	4290	Bu-HTU	4 1/2 x 5 1/2	B&B	Cot.	Sh-21	WO.	36x4	36x7
Mapleleaf...CC	4	4800	Hi-200	4 1/2 x 5 1/2	Ful.	Ful.	Sh-31	WO.	36x5	36x5d	Veteran...S	4	5395	Bu-YTU	4 1/2 x 6	B&B	Cot.	Sh-31	WO.	36x5	36x10
Mapleleaf...DD	5	5625	Hi-1600	4 1/2 x 5 1/2	Ful.	Ful.	Sh-51	WO.	36x6	36x6d											

## Current Tractor Specifications

MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE		Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE		Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	ENGINE		Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)	
				Make	No. of Cyls. Bore & Stroke							Make	No. of Cyls. Bore & Stroke						Make	No. of Cyls. Bore & Stroke			
Allis-Chalmers...	0-12	1	\$325	LeR.	4-3 1/2 x 4 1/2	2500	48x 6	Gray.....EU	22-40	4	2385	Wau.	4-5 x 6 1/2	6900	†	Rumely OilPull..E	30-60	8-10	Own.	2-10x12	26000	80x30	
Allis-Chalmers...	15-25	3	1285	Mid.	4-4 1/2 x 5 1/2	4700	46x12	Hart-Parr.....20	20	2	.....	Own.	2-5 1/2 x 6 1/2	4250	46x10	Russell.....15-30	3-4	.....	Chi.	4-5 x 6 1/2	6900	56x14	
Allis-Chalmers...	20-35	4	1885	Own.	4-4 1/2 x 6 1/2	6150	50x12	Hart-Parr.....30	30	3	.....	Own.	2-6 1/2 x 7	5220	52x10	Russell.....20-40	4-5	.....	Chi.	4-5 1/2 x 7	7900	60x16	
Allwork.....D	20-38	4-5	1695	Own.	4-5 x 7	6500	48x14	Hart-Parr.....(Road)	30	3	.....	Own.	2-6 1/2 x 7	7510	52x18	Russell.....30-60	9-10	.....	Own.	4-8 x 10	22550	84x22	
Allwork.....C	14-28	3	1495	Own.	4-4 1/2 x 6	4800	48x12	Hart-Parr.....40	40	4	.....	Own.	4-4 1/2 x 6 1/2	7560	32x18	Shaw-Enechs (Gr.)	30-60	.....	LeR.	4-3 1/2 x 4 1/2	4400	48x 8	
Aultman-Taylor...	16-30	3	1295	Own.	4-5 x 6	5200	48x12	Heider.....D	9-16	2	.....	Wau.	4-4 1/2 x 5 1/2	4000	54x 8	Topp-Stewart...B	30-45	4	.....	Wau.	4-4 1/2 x 6 1/2	7800	42x12
Aultman-Taylor...	15-30	3-4	1900	Chi.	4-5 x 6 1/2	7800	70x12	Heider.....C	12-20	3	.....	Wau.	4-4 1/2 x 6 1/2	6000	57x10	Tore.....6-10	2	3675	LeR.	4-3 1/2 x 4 1/2	2900	41x 9	
Aultman-Taylor...	22-45	4-6	3100	Own.	4-5 1/2 x 8	12500	70x20	Heider.....M-2	5-10	1	.....	LeR.	4-3 1/2 x 4 1/2	2800	46x 6	Townsend.....10-20	2-3	800	Own.	2-6 1/2 x 7	4500	48x12	
Aultman-Taylor...	30-60	8-10	4400	Own.	4-7 x 9	22500	90x24	Huber.....(Light 4)	12-25	3	985	Wau.	4-4 1/2 x 5 1/2	5000	60x10	Townsend.....15-30	3-4	1350	Own.	2-7 x 8	6500	56x18	
Avery.....15-30	3-4	1	.....	Own.	4-4 1/2 x 6	4750	50x12	Huber.....(Super 4)	15-30	3	.....	Mid.	4-4 1/2 x 6	6000	60x10	Townsend.....25-50	4-8	2250	Own.	2-8 1/2 x 10	11500	60x24	
Avery.....20-35	4-5	3	.....	Own.	4-4 1/2 x 7	7500	60x16	Lauson.....S	12-25	3	.....	Mid.	4-4 1/2 x 5 1/2	4200	.....	Traylor.....6-12	1	500	LeR.	4-3 1/2 x 4 1/2	1750	38x10	
Avery.....25-50	5-6	5	.....	Own.	4-6 1/2 x 7	12500	69x20	Lauson.....T	15-30	4	.....	Bea.	4-4 1/2 x 6	6200	.....	Twin City.....12-20	3	1200	Own.	4-4 1/2 x 6	4700	50x12	
Avery.....45-65	8-10	8-10	.....	Own.	4-7 1/2 x 8	22000	87 1/2 x 24	Leader.....B	12-18	2	375	Own.	2-6 1/2 x 6	4800	50x12	Twin City.....20-35	5	2750	Own.	4-5 1/2 x 6 1/2	8400	60x20	
Avery, Tr. Runner	3	3	.....	Own.	4-4 x 5 1/2	5000	x 8	Leader.....N	16-32	3-4	1275	Own.	4-5 x 6	5800	52x12	Twin City.....40-65	8	4750	Own.	4-7 1/2 x 9	23700	84x24	
Avery, Road Racer	15-25	3	.....	Own.	6-3 x 4	4800	42x 6	Lincoln.....A	15-30	3	1600	Bud.	4-4 1/2 x 6	5000	40x14	Uncle Sam...C-20	12-20	2-3	.....	Har.	4-4 x 5	3000	46x12
Bates (St. Mule) H	18-25	3	.....	Mid.	4-4 1/2 x 5 1/2	3600	48x10	Little Giant...B	16-22	4	.....	Own.	4-4 1/2 x 5	5200	54x14	Uncle Sam...B-19	20-30	3-4	.....	Bea.	4-4 1/2 x 6	4650	50x12
Bates (St. Mule) F	18-25	3	.....	Mid.	4-4 1/2 x 5 1/2	4850	50x10	Little Giant...A	26-35	6	.....	Own.	4-5 1/2 x 6	8700	66x20	Uncle Sam...D-21	20-30	3-4	.....	Bea.	4-4 1/2 x 6	4600	50x12
Bates (St. Mule) G	25-35	4	.....	Mid.	4-4 1/2 x 6	6500	56x10	Lombard.....100	12-16	.....	.....	Own.	6-5 1/2 x 7	19000	x12	Wallis.....OK	15-27	3	.....	Chi.	4-4 1/2 x 5 1/2	3660	48x12
Bates (St. Mule) G	25-35	4	.....	Mid.	4-4 1/2 x 6	6500	56x10	London.....12-25	3	.....	.....	Mid.	4-4 1/2 x 5 1/2	48x12	Waterloo Boy...N	12-25	3	.....	Chi.	4-4 1/2 x 5 1/2	5869	52x12	
Best.....30-30	4	4250	Ste.	4-4 1/2 x 6 1/2	6000	64x12	McCork-Deering...10-20	2	850	Own.	4-4 1/2 x 5	3700	42x12	Wisconsin.....16-30	3-4	1750	Chi.	4-5 x 6 1/2	5600	52x12			
Best.....30-40	4	.....	Own.	4-4 1/2 x 6 1/2	8100	68x11 1/2	McCork-Deering...15-30	3	1250	Own.	4-4 1/2 x 6	6750	50x12	Wisconsin.....22-40	4-5	2550	Chi.	4-5 1/2 x 7	7500	52x12			
Best.....60-60	9	.....	Own.	4-6 1/2 x 8	18580	39x20	Minneapolis.....12-25	3	.....	Own.	4-4 1/2 x 7	6600	56x12	Yuba (Ball Tread)...15-25	4	2750	Wis.	4-4 1/2 x 6	8750	36x12			
Bryan.....Steam	15-30	3	2385	Own.	2-4 x 5	5500	52x13	Minneapolis.....17-30	3-4	.....	.....	Own.	4-6 x 7	12410	62x20	Yuba (Ball Tread)...25-40	8	4500	Own.	4-5 1/2 x 7	10130	48x17	
Case.....12-20	3	895	Own.	4-4 1/2 x 5	4230	42x12	Minneapolis.....22-44	4-5	.....	Own.	4-7 x 8	12410	62x20										
Case.....15-27	3-4	1350	Own.	4-4 1/2 x 6	6600	52x14	Minneapolis.....35-70	8-10	.....	.....	Own.	4-7 1/2 x 9	22500	85x30									
Case.....22-40	4-5	2650	Own.	4-5 1/2 x 6 1/2	10700	56x16	Moline (Un.)...D	9-18	2-3	725	Own.	4-3 1/2 x 5	3380	52x 8									
Case.....40-72	8-10	4900	Own.	4-7 x 8	21200	72x20	Moline (Orc.)...D	9-18	2-3	725	Own.	4-3 1/2 x 5	3340	44x 8									
Caterpillar...3 Ton	15	.....	Own.	4-4 1/2 x 5	4000	.....	Monarch.....C	20-30	4	3800	Bea.	4-4 1/2 x 6	8700	60x12									
Caterpillar...5 Ton	25	.....	Own.	4-4 1/2 x 6	9400	.....	Monarch.....E	25-40	.....	5000	Bea.	4-4 1/2 x 6	12000	67x12									
Caterpillar...10 Ton	40	6	.....	Own.	4-6 1/2 x 7	20000	.....	Monarch.....D	35-60	.....	6000	Bea.	6-4 1/2 x 6	15000	89x12								
Cletrac.....F	10-16	2	815	Own.	4-3 1/2 x 4 1/2	1930	42x 5 1/2	Nichols-Shepard...20-42	4-6	2800	Own.	2-8 1/2 x 10	13500	64x20									
Cletrac.....W	12-22	2	1345	Own.	4-4 x 5 1/2	3455	48x 8	Nichols-Shepard...25-50	6-8	3320	Own.	2-9 1/2 x 12	20500	69x28									
Eagle.....F	12-22	3	.....	Own.	2-7 x 8	5850	48x12	Nichols-Shepard...35-70	8-12	4030	Own.	2-10 1/2 x 14	30000	73x32									
Eagle.....H	16-30	4	.....	Own.	2-8 x 8	7100	48x12	Pioneer.....G	18-36	4	.....	Own.	4-5 1/2 x 6	6500	60x18								
E-B.....AA	12-20	3	.....	Own.	4-4 1/2 x 5	4550	54x12	Pioneer.....C	40-75	10	.....	Own.	4-7 x 8	24000	96x24								
E-B.....Q	12-20	3	.....	Own.	4-4 1/2 x 5	6500	60x12	Rumely OilPull..K	12-20	3	.....	Own.	2-6 x 8	6638	51x12								
E-B.....12-30	3	.....	Own.	4-5 1/2 x 7	9100	72x16	Rumely OilPull..H	16-30	4	.....	Own.	2-7 x 8 1/2	8506	56x16									
Fagot.....19-12	2	1200	Lyc.	4-3 1/2 x 5	3600	48x 8 1/2	Rumely OilPull..G	20-40	6	.....	Own.	2-8 x 10	12968	64x20									
Fordson.....-18	2	420	Own.	4-4 x 5	2562	42x12																	
Frick.....12-20	2	1000	Erd.	4-4 x 6	5800	60x10																	
Frick.....C	15-28	3	1600	Bea.	4-4 1/2 x 6	6730	60x12																

MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE		Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE		Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)	MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	ENGINE		Weight (Lbs.)	Traction Members, Dimensions, Diameter & Face (Ins.)	
				Make	No. of Cyls. Bore & Stroke							Make	No. of Cyls. Bore & Stroke						Make	No. of Cyls. Bore & Stroke			
Allis-Chalmers...	0-12	1	\$325	LeR.	4-3 1/2 x 4 1/2	2500	48x 6	Gray.....EU	22-40	4	2385	Wau.	4-5 x 6 1/2	6900	†	Rumely OilPull..E	30-60	8-10	Own.	2-10x12	26000	80x30	
Allis-Chalmers...	15-25	3	1285	Mid.	4-4 1/2 x 5 1/2	4700	46x12	Hart-Parr.....20	20	2	.....	Own.	2-5 1/2 x 6 1/2	4250	46x10	Russell.....15-30	3-4	.....	Chi.	4-5 x 6 1/2	6900	56x14	
Allis-Chalmers...	20-35	4	1885	Own.	4-4 1/2 x 6 1/2	6150	50x12	Hart-Parr.....30	30	3	.....	Own.	2-6 1/2 x 7	5220	52x10	Russell.....20-40	4-5	.....	Chi.	4-5 1/2 x 7	7900	60x16	
Allwork.....D	20-38	4-5	1695	Own.	4-5 x 7	6500	48x14	Hart-Parr.....(Road)	30	3	.....	Own.	2-6 1/2 x 7	7510	52x18	Russell.....30-60	9-10	.....	Own.	4-8 x 10	22550	84x22	
Allwork.....C	14-28	3	1495	Own.	4-4 1/2 x 6	4800	48x12	Hart-Parr.....40	40	4	.....	Own.	4-4 1/2 x 6 1/2	7560	32x18	Shaw-Enechs (Gr.)	30-60	.....	LeR.	4-3 1/2 x 4 1/2	4400	48x 8	
Aultman-Taylor...	16-30	3	1295	Own.	4-5 x 6	5200	48x12	Heider.....D	9-16	2	.....	Wau.	4-4 1/2 x 5 1/2	4000	54x 8	Topp-Stewart...B	30-45	4	.....	Wau.	4-4 1/2 x 6 1/2	7800	42x12
Aultman-Taylor...	15-30	3-4	1900	Chi.	4-5 x 6 1/2	7800	70x12	Heider.....C	12-20	3	.....	Wau.	4-4 1/2 x 6 1/2	6000	57x10	Tore.....6-10	2	3675	LeR.	4-3 1/2 x 4 1/2	2900	41x 9	
Aultman-Taylor...	22-45	4-6	3100	Own.	4-5 1/2 x 8	12500	70x20	Heider.....M-2	5-10	1	.....	LeR.	4-3 1/2 x 4 1/2	2800	46x 6	Townsend.....10-20	2-3	800	Own.	2-6 1/2 x 7	4500	48x12	
Aultman-Taylor...	30-60	8-10	4400	Own.	4-7 x 9	22500	90x24	Huber.....(Light 4)	12-25	3	985	Wau.	4-4 1/2 x 5 1/2	5000	60x10	Townsend.....15-30	3-4	1350	Own.	2-7 x 8	6500	56x18	
Avery.....15-30	3-4	1	.....	Own.	4-4 1/2 x 6	4750	50x12	Huber.....(Super 4)	15-30	3	.....	Mid.	4-4 1/2 x 6	6000	60x10	Townsend.....25-50	4-8	2250	Own.	2-8 1/2 x 10	11500	60x24	
Avery.....20-35	4-5	3	.....	Own.	4-4 1/2 x 7	7500	60x16	Lauson.....S	12-25	3	.....	Mid.	4-4 1/2 x 5 1/2	4200	.....	Traylor.....6-12	1	500	LeR.	4-3 1/2 x 4 1/2	1750	38x10	
Avery.....25-50	5-6	5	.....	Own.	4-6 1/2 x 7	12500	69x20	Lauson.....T	15-30	4	.....	Bea.	4-4 1/2 x 6	6200	.....	Twin City.....12-20	3	1200	Own.	4-4 1/2 x 6	4700	50x12	
Avery.....45-65	8-10	8-10	.....	Own.	4-7 1/2 x 8	22000	87 1/2 x 24	Leader.....B	12-18	2	375	Own.	2-6 1/2 x 6	4800	50x12	Twin City.....20-35	5	2750	Own.	4-5 1/2 x 6 1/2	8400	60x20	
Avery, Tr. Runner	3	3	.....	Own.	4-4 x 5 1/2	5000	x 8	Leader.....N	16-32	3-4	1275	Own.	4-5 x 6	5800	52x12	Twin City.....40-65	8	4750	Own.	4-7 1/2 x 9	23700	84x24	
Avery, Road Racer	15-25	3	.....	Own.	6-3 x 4	4800	42x 6	Lincoln.....A	15-30	3	1600	Bud.	4-4 1/2 x 6	5000	40x14	Uncle Sam...C-20	12-20	2-3	.....	Har.	4-4 x 5	3000	46x12
Bates (St. Mule) H	18-25	3	.....	Mid.	4-4 1/2 x 5 1/2	3600	48x10	Little Giant...B	16-22	4	.....	Own.	4-4 1/2 x 5	5200	54x14	Uncle Sam...B-19	20-30	3-4	.....	Bea.	4-4 1/2 x 6	4650	50x12
Bates (St. Mule) F	18-25	3	.....	Mid.	4-4 1/2 x 5 1/2	4850	50x10	Little Giant...A	26-3														

## GARDEN TRACTORS

Are.....	F	3-6	1	\$385	Own.	1-4 1/2 x 5	1000	30x 4
Beeman.....	Jr.	1 1/2-4	1	195	B&S.	1-2 1/2 x 2 1/2	210	30x 3
Beeman.....	K	1 1/2-4	1	285	Own.	1-3 1/2 x 4	550	25x 3 1/2
Belant.....		1923	1	180	B&S.	1-2 1/2 x 2 1/2	200	16x 3
Centaur.....		1923	1	345	N-W.	1-4 1/2 x 4	800	28x 4
Do-It-All.....	(Jack)	2 1/2-6	1	395	Own.	1-3 1/2 x 3 1/2	750	
Do-It-All.....	(Baby)	2 1/2-6	1	495	Own.	1-4 1/2 x 5	1200	26x 2 1/2
Do-It-All.....	(Twain)	4-15	1	495	Own.	2-3 1/2 x 3 1/2	800	32x 4
Kinkade.....		1 1/2-3	1	190	Own.	1-3 x 3	180	22x 5 1/2
M.B.M. Red.....	E	1-4 1/2	1	250	Own.	1-3 1/2 x 4	410	20x 3
Motor Macultivator				148	Own.	1-2 1/2 x 3 1/2	210	19x 3 1/2
N.B.....		2	1	375	Own.	2-2 1/2 x 4	750	32x 4
Utilitor.....	501	2 1/2-4	1	295	Own.	1-3 1/2 x 4	750	24 1/2 x 3 1/2
Utilitor.....	501A	2 1/2-4	1	340	Own.	1-3 1/2 x 4	925	24 1/2 x 3 1/2



# Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES						Wheel Base (Ins.)	Tire Size (Ins.)	NAME AND MODEL	ENGINE			ELECTRICAL SYSTEM		Clutch: Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE		BRAKES, Service and Emergency		
OPEN MODELS			CLOSED MODELS						Make and Model	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make				Ignition Make	Type and Make		Gear Ratio	
2-3 Pass.	4-5 Pass.	6-7 Pass.	2-3 Pass.	4-5 Pass.	6-7 Pass.																
\$1950c	\$1785	\$1850	\$1885c	\$2350	\$2485	127	33x4 1/2	American.....D-46	H-S. 11000	6-3 1/2x5	29.40	Strom.	G-D.	A-K.	s-p	B&B.	B & B.	m Hart.	F Salis	4.50	R-L-R
	1195		1445c	1425	1495	115	32x4	*1Anderson.....41	Cont...7 U	6-3 1/2x4 1/2	23.44	Zenith.	West.	West.	s-p	B&B.	Duration.	f Univ.	1/2 F Salis	4.75	R-L-T
		1595				122	32x4	*1Anderson.....50	Cont...8 R	6-3 1/2x4 1/2	27.34	Zenith.	Remy.	Remy.	s-p	B&B.	Duration.	f Univ.	1/2 F Salis	1.50	R-L-T
	1535				2200	120	32x4	Apperson.....6	Falls.....	6-3 1/2x4 1/2	23.44	Strom.	Remy.	Remy.	s-p	Rock.	Mech.	m Thie.	1/2 F Col.	5.10	R-L-R
	2800	2800			3750	130	33x5	Apperson.....8-23-S	Own.....	8-3 1/2x5	33.80	Johnson.	Bijur.	Remy.	m-d	Own.	Own.	m Thie.	1/2 F Own	4.25	R-L-R
	1095		1325d	1495d	1595	114	31x4	Auburn.....6-43	Cont...7 U	6-3 1/2x4 1/2	23.44	Strom.	Remy.	Remy.	s-p	B&B.	Warner.	m Univ.	1/2 F Col.	4.63	R-L-T
	1595		1850d		2145	124	32x4 1/2	Auburn.....6-43	Own.....	6-3 1/2x5	25.35	Strom.	Remy.	Remy.	s-p	B&B.	Warner.	m Univ.	1/2 F Col.	4.63	R-L-T
	1395		1495d	1685d	1850	118	32x4	Barley.....6-50	Cont...7 U	6-3 1/2x4 1/2	23.44	Strom.	Delco.	Delco.	s-p	B&B.	Fuller.	f M&E.	1/2 F Col.	5.10	R-L-R
	935	965		800g	1395c	109	31x4	Buick.....1924	Own.....	4-3 1/2x4 1/2	18.23	Marvel.	Delco.	Delco.	m-d	Own.	Own.	m Own.	1/2 F Own	4.66	F-L-R
	1275	1295		1135g	1995c	120	32x4	Buick.....1924	Own.....	6-3 1/2x4 1/2	27.34	Marvel.	Delco.	Delco.	m-d	Own.	Own.	m Own.	1/2 F Own	4.10	F-L-R
	1385g		1565	1675a	2235d	128	32x4 1/2	Buick.....1924	Own.....	6-3 1/2x4 1/2	27.34	Marvel.	Delco.	Delco.	m-d	Own.	Own.	m Own.	1/2 F Own	4.70	F-L-R
	2985	2985	2985	3875	4250	132	33x5	Cadillac.....V 63	Own.....	8-3 1/2x5 1/2	31.25	Own.	Delco.	Delco.	m-d	Own.	Own.	m Spicer	F Tim	Opt.	F-L-R
	1750	1790		2230d	2480c	122	32x4 1/2	Case.....X	Cont...8 R	6-3 1/2x4 1/2	27.34	Schebler.	Delco.	Delco.	m-d	Own.	Own.	f Sneed.	1/2 F Col.	4.90	R-L-R
		2475		1335d	1535	132	33x5	Case.....Y	Cont...6 T	6-3 1/2x4 1/2	31.54	Rayfield.	Delco.	Delco.	m-d	Own.	Own.	f Sneed.	1/2 F Col.	4.70	R-L-R
	1185		1295		2095	117	32x4	*1Chalmers.....1923	Own.....	6-3 1/2x4 1/2	25.35	Strom.	A-L.	A-L.	m-d	Own.	Own.	m Mech.	1/2 F Tim	5.13	R-L-R
	1595	1485	1635	1785c	1785	123	32x4	*1Chalmers.....1923	Own.....	6-3 1/2x4 1/2	25.35	Strom.	A-L.	A-L.	m-d	Own.	Own.	m Mech.	1/2 F Tim	5.13	R-L-R
		1685			2270	103	30x3 1/2	Chandler.....Six	Own.....	6-3 1/2x5	29.40	Strom.	Bosch.	Bosch.	s-p	B&B.	Own.	Own.	1/2 F Own	4.45	R-L-T
	490	495	395g		795			Chevrolet...Superior	Own.....	4-3 1/2x4	21.76	Zenith.	Remy.	Remy.	c	Own.	Own.	m Own.	1/2 F Own	3.77	R-L-R
	1085	1045		1145d	1245	112 1/2	31x4	Cleveland.....42	Own.....	6-3 1/2x4 1/2	22.50	Strom.	Bosch.	Bosch.	s-p	B&B.	Own.	m Mech.	1/2 F Own	4.90	R-L-T
	2175	2175	2175	2475	2750c	127 1/2	33x5 1/2	Cole.....Master	Nort.M311	8-3 1/2x4 1/2	39.20	Johnson.	Delco.	Delco.	m-d	Nort.	Nort.	m Spicer	F Col.	4.70	R-L-R
		1475			1995	115	32x4	Columbia...Big Six	Cont...8 R	6-3 1/2x4 1/2	27.34	Strom.	A-L.	A-K.	s-p	B&B.	Duration.	m Spicer	1/2 F Tim	4.75	R-L-R
	995	995		1195d	1395	115	31x4	Columbia...Light Six	Cont...6 Y	6-3 1/2x4 1/2	23.44	Strom.	A-L.	A-L.	s-p	B&B.	Duration.	m Spicer	1/2 F Tim	5.10	R-L-T
	1385p	1295		1595c	1495	116	32x4	Courier.....	Falls. 8000	6-3 1/2x4 1/2	23.44	Strom.	West.	A-K.	s-p	B&B.	Muncie.	f Flex.	1/2 F Col.	5.10	R-L-R
		3100	3100		4500	138	33x4 1/2	Crawford.....23-6-70	Cont...6 T	6-3 1/2x5 1/2	31.54	Zenith.	West.	Bosch.	m-d	B-L.	B-L.	m Spicer	1/2 F Tim		R-L-R
		5800	6300		7650	142	33x5	Crawford...Dagmar-6-70	Cont...6 T	6-3 1/2x5 1/2	31.54	Zenith.	West.	Bosch.	m-d	B-L.	B-L.	m Spicer	1/2 F Tim		R-L-R
								Cunningham...V 4	Own.....	8-3 1/2x5	45.00	Strom.	Delco.	Delco.	m-d	Own.	Own.	f Sneed.	1/2 F Tim	4.23	R-L-R
	5000	4650	4700	4650c	6350	132	33x5	Daniels.....23-38	Own.....	8-3 1/2x5 1/2	39.20	Zenith.	Delco.	Delco.	m-d	Own.	Own.	m Spicer	F Tim	4.23	R-L-R
		5000	5150		6600	138	33x5	Daniels.....23-38	Own.....	8-3 1/2x5 1/2	39.20	Zenith.	Delco.	Delco.	m-d	Own.	Own.	m Spicer	F Tim	4.23	R-L-R
	1295	1495		1495c	1595	115	31x4	Davis.....71	Cont...7 U	6-3 1/2x4 1/2	23.44	Strom.	Delco.	Delco.	s-p	B&B.	Warner.	m Peters	1/2 F Tim	5.10	R-L-R
	850	880		730g	1035	116	32x4	Dodge Brothers.....	Own.....	4-3 1/2x4 1/2	24.03	Stewart.	N.E.	N.E.	m-d	Own.	Own.	m Own.	1/2 F Own	4.54	R-L-R
		3950	3950	4150c	4935c	136	32x6	Dorris.....6-88	Own.....	6-4 x5	38.40	Strom.	West.	Bosch.	m-d	Own.	B-L.	m Spicer	1/2 F Tim	3.77	R-L-R
		1095		1245c	1535d	115	31x4	Dort.....27	Falls T8000	6-3 1/2x4 1/2	23.44	Carter.	Bosch.	Bosch.	m-d	Det.	Own.	m Ther.	1/2 F Fin.	4.66	R-L-R
	6500	6250	6750	6500c	7800d	134	33x5	Duesenberg...Straight 5	Own.....	8-2 1/2x5	26.45	Strom.	Delco.	Delco.	s-p	Own.	Own.	f Cli.	1/2 F Own	4.45	F-L-R
	890	860		1065d	1305	109	31x4	Durant.....A-22	Cont...Spec	4-3 1/2x4 1/2	24.03	Tillotson	A-L.	A-L.	s-p	Own.	Warner.	m Spicer	1/2 F Ad.	4.33	R-L-R
					1465																
	1485	1095		1275d	1395c	112	32x4	Earl.....40	Own.....	4-3 1/2x5 1/2	18.91	Scow.	A-L.	Conn.	s-p	B&B.	Own.	f Own.	1/2 F Own	4.87	R-L-T
		995		1195d	1265d	112	31x4	Elcar.....4-40	Lye.....K	4-3 1/2x5	21.03	Strom.	Delco.	Delco.	s-p	B&B.	Warner.	m Peters	1/2 F Salis	4.50	R-L-R
		1395		1595d	1995d	118	32x4	Elcar.....6-60	Cont...8 R	6-3 1/2x4 1/2	27.34	Strom.	Delco.	Delco.	s-p	B&B.	Warner.	m Spicer	1/2 F Salis	4.50	R-L-R
		1895			2345	118	32x4 1/2	Elgin.....	Falls-Spec.	4-3 1/2x4 1/2	23.44	Strom.	Delco.	Delco.	s-p	B&B.	Warner.	f	1/2 F Col.	4.33	F-L-R
		850			975	110 1/2	31x3 1/2	Esser.....	Own.....	6-2 1/2x4	16.54	Own.	Bosch.	Bosch.	m-d	Own.	Own.	m Spicer	1/2 F Own	5.40	R-L-R
	1195	1195		1195	1895c	120	32x4 1/2	Flint.....	Cont...Spec	6-3 1/2x5	27.34	Strom.	Delco.	Delco.	s-p	Own.	Warner.	m Spicer	1/2 F Ad.		R-L-R
	265r	295a	230g		525	100	30x3 1/2	Ford.....T	Own.....	4-3 1/2x4	22.50	Own.	Holley.	Own.	m-d	Own.	Own.	m Own.	1/2 F Own	3.63	T-L-R
	2975	2975		3975	3975	132	32x4 1/2	Fox.....Air-Cooled	Own.....	6-3 1/2x5	27.34	Zenith.	West.	Scintilla	m-d	B-L.	B-L.	m Spicer	1/2 F Tim	4.90	R-L-R
		1950		2750c	2250	115	32x4 1/2	Franklin.....10-B	Own.....	6-3 1/2x4	25.35	Own.	A.K.	A-K.	s-p	M&E.	Own.	m Spicer	1/2 F Own	4.73	T-L-R
	995	995	1095d	1155c	1145	112	32x4	Gardner.....Series 5	Lye...Spec	4-3 1/2x5	21.76	Zenith.	West.	West.	s-p	B&B.	Mech.	m Peters	1/2 F Fin.	4.80	R-L-T
	510	520		625d	685	100	30x3 1/2	Gray.....	Own.....	4-3 1/2x4	21.03	Scow.	West.	West.	s-p	Own.	Own.	m Mech.	1/2 F Tim	3.90	R-L-T
	2250	2250				120	32x4 1/2	H.C.S.....Series 4	Weid.....	4-3 1/2x5 1/2	22.50	Strom.	Delco.	Delco.	m-d	B-L.	B-L.	m Spicer	1/2 F Own	4.63	R-L-R
		2650			3350	126	32x4 1/2	H.C.S.....Series 6	Own.....	6-3 1/2x5	29.40	Strom.	Delco.	Delco.	m-d	B-L.	B-L.	m Spicer	1/2 F Own	4.36	R-L-R
	1395	1395		1495c	2195	121	32x4	Hanson.....66	Cont...8 R	6-3 1/2x4 1/2	27.34	Marvel.	Delco.	Delco.	s-p	B&B.	G-L.	m Univ.	1/2 F Tim	4.66	R-L-R
		1345	1345c		1950	115	32x4	Hatfield.....A-42	H-S. 7000	4-3 1/2x5	19.60	Zenith.	Dyneto	Conn.	s-p	B&B.	G-L.	m Spicer	1/2 F Col.	4.66	R-L-R
		1775		2175c	2350	121	32x4	Haynes.....6-55	H-S. 40	6-3 1/2x5	25.35	Strom.	Bosch.	Bosch.	s-p	B&B.	Duration.	m Univ.	1/2 F Col.	4.63	R-L-R
	1995		1995	2150	2695d	132	33x5	Haynes.....77	Own.....	6-3 1/2x5 1/2	31.54	Strom.	L-N.	Kingst.	m-d	War.	Own.	m Univ.	1/2 F Own	4.60	R-L-R
		1295		1695b	2195	121	32x4 1/2	Haynes.....60	Own.....	6-3 1/2x4 1/2	29.40	Rayfield.	L-N.	Kingst.	m-d	War.	Mech.	m Ther.	1/2 F Own	4.41	R-L-T
		1395		1750d	1895	126	34x4 1/2	Hudson.....Super 6	Own.....	6-3 1/2x5	29.40	Own.	Bosch.	Bosch.	m-d	Own.	Own.	m Spicer	1/2 F Own	4.45	R-L-R
		1175		1195a	1445	115	32x4	Hupmobile...Series 8	Own.....	4-3 1/2x5 1/2	16.90	Strom.	West.	A-K.	m-d	Long.	Own.	m Univ.	1/2 F Own	4.87	R-L-R
		1195	1065	960g	1135d	112	31x4	Jawett.....Six	Own.....	6-3 1/2x5	25.36	(Strom.)	Remy.	A-K.	m-d	Long.	Warner.	m Mech.	1/2 F Tim	4.45	R-L-T
					1495																
	1750	1675			2285c	120	32x4	Jordan.....MX	Cont...Spec	6-3 1/2x4 1/2	26.34	Strom.	Delco.	Delco.	s-p	Detr.	Detroit				

# New List Prices on **American Hammered Piston Rings**

(including oil groove rings)  
effective December 7, 1923

## 30¢ and up

2 1-2 in. to 3 15-16 in.	\$ .30
4 in. to 4 7-16 in.	.40
4 1-2 in. to 4 15-16 in.	.50
5 in. to 5 15-16 in.	.75
6 in. to 6 15-16 in.	1.00
7 in. to 7 15-16 in.	1.50

No Extra Charge for Oversize Rings  
*Nothing Changed But the List Prices*



AMERICAN HAMMERED PISTON RING COMPANY, Baltimore, Md.

Factory Stocks

Baltimore  
Bush and Hamburg

Chicago  
2133½ S. Michigan Ave.

San Francisco  
931 Larkin Street



# Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES						Wheel Base (Ins.)	Tire Size (Ins.)	NAME AND MODEL	ENGINE			ELECTRICAL SYSTEM		Clutch: Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE		BRAKES, Service and Emergency		
OPEN MODELS			CLOSED MODELS						Make and Model	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make				Ignition Make	Type and Make		Gear Ratio	
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	6-7 Pass.															
5000	5000	5000	4200c	6300	6500	132	33x5	LaFayette	Own	8-3 1/2x5 1/2	33.80	Johnson	Delco	Delco	m-d Own.	Own	m Own.	F Own	4.58	R-R	
1795	1795	1795	2145d	2345	2345	123	32x4 1/2	Lexington..... 23	Ans. M	6-3 1/2x4 1/2	26.30	Rayfield	Delco	Delco	s-p Long.	Warner	f Sneed	1/2 F Salis	5.10	R-T	
3800	3800c	3800		4600c	4400	136	33x5	Lincoln.....	Own	8-3 1/2x5 1/2	36.45	Strom	Delco	Delco	m-d Own.	Own	m Spicer	F Tim	4.59	R-R	
8990	7900	7900			11750	11600	142	35x5	*2Locomobile Series 8	Own	6-4 1/2x5 1/2	48.60	Ball & B.	West.	Delco	m-d Own.	Own	m Own.	F Own	3.85	R-R
2300g	2785	2785	2985a	3585	4285	136	32x4 1/2	*3Marmon..... 31	Own	6-3 1/2x5 1/2	33.75	Strom	Delco	Delco	m-d Own.	Own	m Spicer	3/4 F Own	4.10	R-R	
795	795		2985c	3985	3985	109	31x4	Maxwell.....	Own	4-3 1/2x4 1/2	21.03	Stewart	Remy	Remy	s-p Mech.	Own	f Own.	1/2 F Own	4.60	R-T	
2500	2500		895b	1195	1585d	127	32x4 1/2	McFarlan.....	Own	6-3 1/2x5 1/2	27.34	Rayfield	Delco	Delco	m-d						
5400	5600	5700	975d	3000	3000	140	33x5	*4McFarlan..... 1923	Own	6-4 1/2x6 1/2	48.00	Rayfield	West.	West.	m-d M&E	B-L	m Peters	1/2 F Tim	3.75	R-R	
3950b		3950c		4650	5250	132	32x4 1/2	Mercer..... Series 5	Own	4-3 1/2x6 1/2	22.50	Ball & B.	West.	Eisem.	m-d Own.	Own	m Spicer	F Own	3.87	T-R	
	3750c	3750c	3750c	4700	5000	132	32x4 1/2	Mercer..... 6	Own	6-3 1/2x5 1/2	33.75	Strom	West.	Eisem.	m-d Own.	Own	m Spicer	3/4 F Own	3.77	T-R	
1295	1295		1495d	1685c	1695	115	31x4	Moon..... U6-40	Cont. 7 U	6-3 1/2x4 1/2	23.41	Strom	Delco	Delco	s-p B&B.	Warner	m Spicer	1/2 F Tim	5.10	R-T	
		1785	2150	2585	2485	128	32x4 1/2	Moon..... 6-58	Cont. 8 R	6-3 1/2x4 1/2	27.31	Strom	Delco	Delco	s-p B&B.	B-L	m Spicer	1/2 F Tim	5.09	R-R	
1240	1210	1050g	1645c	2090c	2090	121	33x4	Nash..... 691-3-6-7	Own	6-3 1/2x5 1/2	25.35	Marvel	Delco	Delco	s-p B&B.	Own	m Own.	1/2 F Own	4.50	R-T	
915	935	1390	1195d		1445	112	33x4	Nash..... 692-4-5-8	Own	6-3 1/2x5 1/2	25.35	Marvel	Delco	Delco	s-p B&B.	Own	m Own.	1/2 F Own	4.90	R-T	
					1275			Nash..... 41-8	Own	4-3 1/2x5 1/2	18.23	Marvel	Delco	Delco	s-p B&B.	Own	m Own.	1/2 F Own	4.88	R-T	
2175	2475c	2375	2485d		3250	130	32x4 1/2	National..... BB	Own	6-3 1/2x5 1/2	29.40	Rayfield	West.	Delco	s-p B&B.	B-L	m Univ.	F Col.	4.08	R-R	
2500	2500c	2600c		3500		128	33x5	Noma..... 4C	Cont. 8 R	6-3 1/2x4 1/2	27.34	Zenith	Delco	Delco	s-p B&B.	Detroit	m Spicer	1/2 F Tim	4.45	R-R	
945	945		1095a	1195	1345	113	31x4	Oakland..... 6-54	Own	6-2 1/2x4 1/2	18.90	Strom	Remy	Remy	s-p Hoos.	Muncie	m Mech.	1/2 F Own	4.70	F-T	
750	750		1095d	955	1035	110	31x4	Oldsmobile..... 30	Own	6-2 1/2x4 1/2	18.15	Zenith	Delco	Delco	s-p B&B.	Muncie	f Own.	1/2 F Own	5.10	R-T	
495	495		885d	750	1095	100	30x3 1/2	Overland..... 91	Own	4-3 1/2x4 1/2	19.60	Tillotson	A-L	A-L	s-p B&B.	Own	m Own.	1/2 F Own	4.50	R-R	
695			395g		695d	106	30x3 1/2	Overland..... 92	Own	4-3 1/2x4 1/2	19.60	Tillotson	A-L	A-L	s-p B&B.	Own	m Own.	1/2 F Own	4.50	R-R	
2485	2485	2250g	2650c	3175c	3275	126	33x4 1/2	Packard..... 126	Own	6-3 1/2x5 1/2	27.31	Own	A-K	Delco	m-d Own.	Own	m Spicer	1/2 F Own	4.66	R-R	
3850c	3650	2685	2350g		3525f	133	33x1 1/2	Packard..... 133	Own	6-3 1/2x5 1/2	27.31	Own	A-K	Delco	m-d Own.	Own	m Spicer	1/2 F Own	4.66	R-R	
				4550c	4725	136	33x5	Packard "Eight"..... 136	Own	8-3 1/2x5 1/2	36.45	Own	Dyneto	Delco	m-d Own.	Own	m Spicer	1/2 F Own	4.70	F-R	
	3850				4900f	143	33x5	Packard "Eight"..... 143	Own	8-3 1/2x5 1/2	36.45	Own	Dyneto	Delco	m-d Own.	Own	m Spicer	1/2 F Own	4.70	F-R	
	2450				4325f	131	33x4 1/2	Packard "Eight"..... 143	Own	8-3 1/2x5 1/2	36.45	Own	Dyneto	Delco	m-d Own.	Own	m Spicer	1/2 F Own	4.70	F-R	
					3250f	131	33x4 1/2	Paige..... 6-70	Cont. 9 A	6-3 1/2x5 1/2	33.75	Rayfield	Remy	A-K	m-d Long.	Warner	m Meen.	1/2 F Tim	4.90	R-R	
1550	1390	1425	1465d	2395f	2395	120	32x4 1/2	Paterson..... 23-6-52	Cont. 8 R	6-3 1/2x4 1/2	27.31	Strom	Delco	Delco	s-p B&B.	Durston	m Hart.	1/2 F Salis	4.50	R-R	
2690	2750	2260g	3300	3390	3840	128	33x5	Peerless..... 66	Own	8-3 1/2x5 1/2	33.80	Ball & B.	Delco	Delco	m-d Own.	Own	m Spicer	3/4 F Tim	4.90	R-R	
5250	5250	5250		6900	6900	138	33x5	Pierce-Arrow.....	Own	6-4 x5 1/2	38.40	Own	Delco	Delco	m-d Own.	Own	m Own.	1/2 F Own	4.29	R-R	
	1695	1745	1745	2445	2495f	126	32x4 1/2	Pilot..... 6-56	H-S... 90	6-3 1/2x5 1/2	25.35	Tillotson	Wagner	Wagner	s-p Hoos.	Muncie	m Blood.	1/2 F Col.	4.67	R-R	
2535	2535	2585d	2635d		3385	126 1/2	32x4 1/2	Premier..... 6-D	Own	6-3 1/2x5 1/2	27.31	Strom	Delco	Delco	s-p B&B.	Own	m Spicer	1/2 F Tim	4.58	R-R	
	2300	2350	2400c	3000d	3050	124	32x4 1/2	R & V Knight..... H	Own. Kn't	6-3 1/2x4 1/2	29.40	Strom	A-L	A-L	s-p B-L	B-L	m Own.	1/2 F Tim	5.40	R-R	
	1335	1545d			1875	120	32x4	Reo..... T6	Own	6-3 1/2x5 1/2	24.34	Rayfield	N.E.	N.E.	m-d Own.	Own	m Own.	1/2 F Own	4.70	R-R	
3200c	3200	3200c		4000		131	32x4 1/2	Revere..... M	(Dues... 4 Monsen... 4)	4-4 1/2x6	28.90	Strom	West.	Bosch	m-d B-L	B-L	m Own.	1/2 F Std	3.44	R-R	
1685a	1485		1885c	1085		117	32x4	*4Rickenbacker..... B	Own	4-4 1/2x6	30.63	Strom	West.	Bosch	s-p Own.	Warner	m Mech.	1/2 F Col.	5.10	R-T	
2685	2485	2685	2750c	3285	3585	128	32x4 1/2	Roamer..... 6-54-E	Cont. 12XD	6-3 1/2x5 1/2	29.40	Strom	West.	Bosch	s-p B&B.	Warner	f Sneed	1/2 F Tim	4.60		
					4250p	138	32x4 1/2	Roamer..... 6-54-E	Cont. 12XD	6-3 1/2x5 1/2	29.40	Strom	West.	Bosch	s-p B&B.	G-L	f Sneed	1/2 F Tim	4.60	R-R	
3685	3485	3800	3650c	4650p		128	32x4 1/2	Roamer..... 4-75-E	Itch.	4-4 1/2x6	28.90	Strom	West.	Bosch	s-p B&B.	B-L	f Sneed	1/2 F Tim	4.08	R-R	
975			1175	1275		112	31x5 1/4	Rollin.....	Own	4-3 1/2x4 1/2	16.90	Tillotson	Dyneto	Conn	s-p B&B.	Muncie	f Sneed	1/2 F Salis	5.10	F-R	
11400	10900	11450		12800	12850	143 1/2	33x5	Rolls-Royce..... 40-50	Own	6-4 1/2x5 1/2	48.60	Own	Bijur.	Bosch	s-p Own.	Own	m Own.	1/2 F Own	3.72	R-R	
				13500	12900	118	32x4	Rubay.....	Own	4-2 1/2x5 1/4	12.10	Strom	Bosch	Bosch	s-p Own.	Own	m Own.	F Own	5.10	F-R	
1615	1615		2615d	2615		118	33x4	Sayers Six..... DP	Cont. 8 R	6-3 1/2x4 1/2	27.34	Strom	Delco	Delco	s-p B&B.	G-L	m Arvne.	1/2 F Std.	4.75	R-R	
875	875					108	30x3 1/2	Seneca..... L-2 & O-2	l.yc... KB	4-3 1/2x5 1/2	19.60	Zenith	A-L	A-L	s-p B&B.	G-L	m Univ.	F Peru	4.75	R-R	
985						112	31x4	Seneca..... 50c & 51c	l.yc... KB	4-3 1/2x5 1/2	21.03	Zenith	A-L	A-L	s-p B&B.	G-L	m Univ.	F Peru	4.50	R-R	
2750	2750	2750	2425g	3585	3985	130	32x4 1/2	Stanley..... 740	Own	2-4 x5	13.00	None	Bijur.	None	None	None	None	1/2 F Tim	1.50	R-R	
490	490		640d	785	p935d	102	30x3 1/2	Star.....	Cont. Spec	4-3 1/2x4 1/2	15.63	Tillotson	A-L	A-L	s-p Own.	Warner	m Own.	1/2 F Tim	4.87	R-R	
1750c	1750	1445g	e1995p	2350	d2195f	125	34x4 1/2	Stearns-Knight. SK14	Own. Kn't	4-3 1/2x5 1/2	22.50	Schebler	West.	A-K	m-d Own.	Own	f Cli.	1/2 F Own	4.50	R-R	
2395	2395	2495	2195g	3395	3395	130	34x4 1/2	Stearns-Knight..... 6	Own. Kn't	6-3 1/2x5 1/2	27.34	Schebler	West.	A-K	m-d Own.	Own	f Cli.	1/2 F Own	4.70	R-R	
1295	1295		1595d	1995		117	32x4	Stephens..... 10	Own	6-3 1/2x4 1/2	25.35	Strom	Delco	Delco	s-p B&B.	Mech.	m Mech.	1/2 F Tim	5.10	R-T	
1750	1505	1850c		2250		124	33x4 1/2	Stephens..... 20	Own	6-3 1/2x4 1/2	25.35	Strom	Delco	Delco	s-p B&B.	Mech.	m Mech.	1/2 F Tim	5.30	R-T	
1985		2200c		2800	d2750p	125	32x4 1/2	Sterling-Knight.....	Own. Kn't	6-3 1/2x4 1/2	25.35	Strom	West.	West.	m-d Fuller	Fuller	f Clim.	1/2 F Tim	4.66	R-R	
975	995	845g		1195	1485	112	31x4	Studebaker. Light Six	Own	6-3 1/2x4 1/2	23.44	Strom	Wag-R	Wag-R	s-p Own.	Own	f Ther.	1/2 F Own	4.55	R-R	
1325	1350		1100g	1895d	1985	119	32x4	Studebaker. Spec'l Six	Own	6-3 1/2x5 1/2	29.40	Strom	Wag-R	Wag-R	s-p Own.	Own	m Own.	1/2 F Own	4.33	R-R	
1450g		1750	1835d	2495	2685	126	33x4 1/2	Studebaker..... Big Six	Own	6-3 1/2x5 1/2											



## A mechanical helper for the car washer!

**H**ERE'S a handy device for any garage.

The "Gaylord Ideal Overhead Washer" does away with the need for stringing the water hose around the garage floor. It saves water hose. Used in connection with the "Little Giant Water Saver" it cuts water bills practically in half. No possibility of overhead water leaks because there's nothing in the overhead to get out of order—the shut off is at the end of the hose.

The "Gaylord Ideal Overhead Washer" swivels around in a 9 foot circle. Counter-balanced weight makes swinging easy. For night work,

the light is concentrated where the washing is done, and moves with the washer.

The "Gaylord Ideal Overhead Washer" in combination with the "Little Giant Water Saver," costs less than any other overhead system with the water saving feature.

One of these 4 types should fill your particular needs. Order through your jobber. He can supply you.

The Gaylord Mfg. Co., Paterson, N. J.

### Prices:

No. 1	Without counterbalance weight.....	\$12.00
No. 2	1/2 in. size, with counterbalance weight.....	14.00
No. 3	3/4 in. size, with counterbalance weight.....	16.00
No. 4	3/4 in. size, with counterbalance weight and electric light.....	34.00

## GAYLORD IDEAL Overhead Washer



Put a "Little Giant Water Saver" on your hose and stop water waste automatically.

The "Little Giant" looks after the water bills even if you don't. It works entirely automatically. It doesn't have to be "operated."

When you want the water on, you simply grip the nozzle (as illustrated)—a natural, easy way to hold the hose. The water automatically SHUTS OFF the moment you release your grip. You can't go away and leave the water running. Threaded to take 1/4 in. or 3/4 in. hose. Made of brass, finely machined.

Worth its list price of \$3 many times over in water, time and labor saving. Price is subject to dealer's discount.

Show this page to your Jobber's salesman and have him include a "Little Giant" in your next order. He'll be glad to.

THE GAYLORD MFG. CO.

Paterson, N. J.

### GAYLORD LITTLE GIANT Water Saver

Jobbers: Our proposition is worth your while. Write or Wire!



# New Departure Ball Bearings

## Rigidity in Any Mounting Implies Unchanging Support

**E**XTREME rigidity is an essential in all gear mountings. The reason for this is best stated by an authority who says, "A correct position once attained should never be altered. Gears do not require adjustment to compensate for wear."

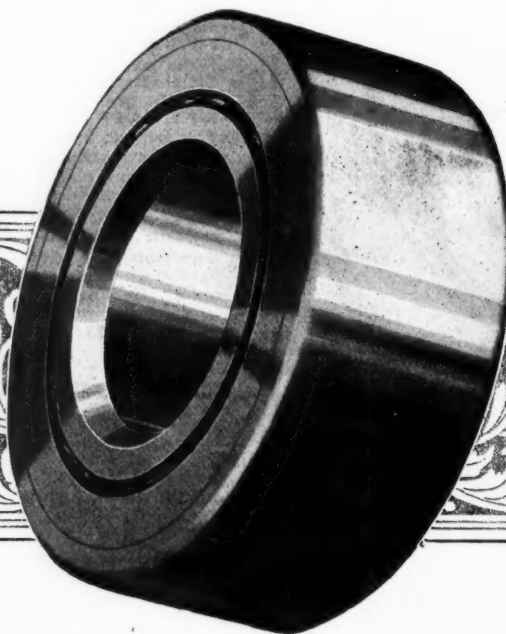
It follows "as night the day" that in order to maintain this correct gear adjustment rigidly and permanently, you *must* use a bearing which does not wear and let down on that adjustment.

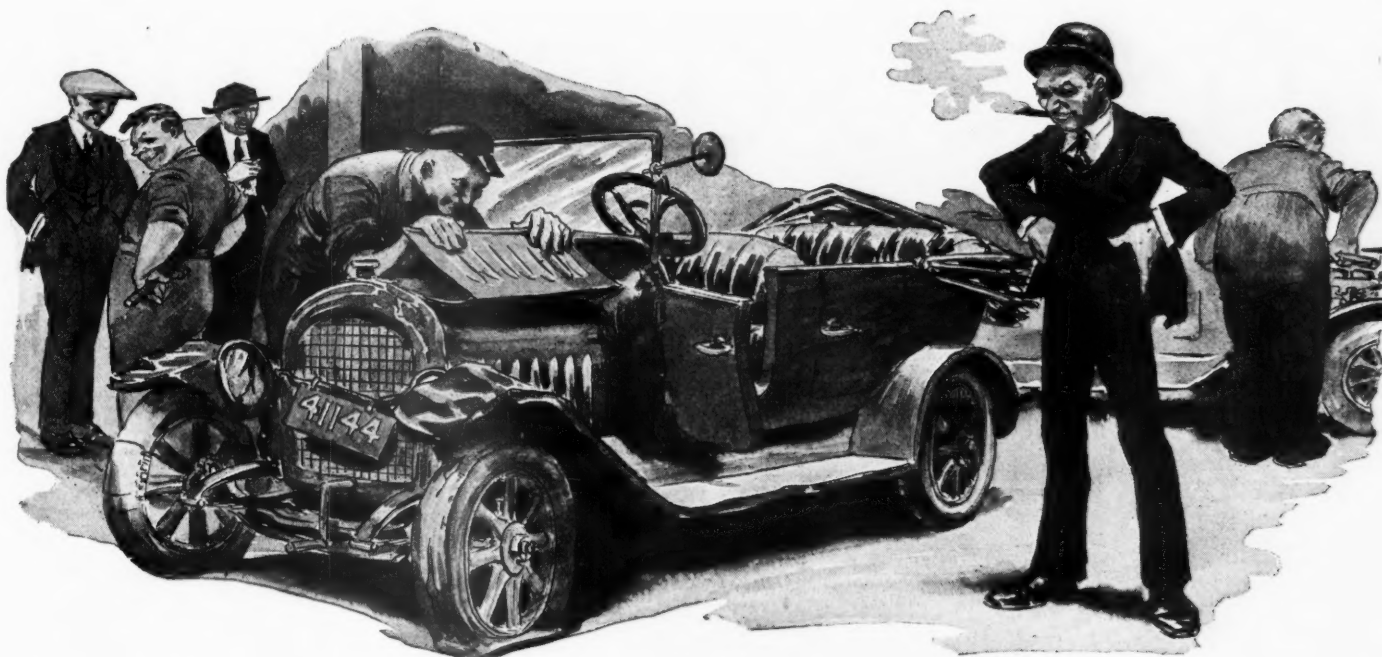
If you support your mounting with a type bearing that, because

of mechanical principle, wears sufficiently to require adjustment at intervals, the position of the gears it supports is constantly being let down, taken up, let down, taken up . . . thereby giving anything but a rigid mounting.

For gear mountings as well as other positions New Departure ball bearings are ideal, because they locate the parts they support permanently. No adjustment is necessary or possible. They outlast the mechanism itself.

THE NEW DEPARTURE MFG. CO.  
Detroit Bristol, Conn. Chicago





## "Why Not Install a New Car on My Brake Lining?"

**H**ERE'S a story one of our friends sends us from up around Erie, Pa.

It seems a man named Jones bought a second hand bus at what he thought was a bargain. She coughed and choked a good deal, but Jones coaxed her as far as the corner garage. "Say, Bill," he says careless-like. "Just picked up this little old last year's boat. Look her over and tell me what she needs."

Bill looked her over and started in to tell him. He started in at the headlights and by the time he reached the rear wheels he stopped for breath.

"For the love of Mike, Bill," says Jones, "is there *anything* about this hunk of junk that don't need fixing?"

"That TESTBESTOS Brake Lining you've got is still in good shape."

"Well," says Jones, "why not install a new car on my brake lining?"

**W**E don't know how much of the story is true, but we are willing to bet on the fact about the TESTBESTOS Brake Lining. If there is one thing TESTBESTOS does, it's *wear*. There's the longest kind of life and service in its long fibred asbestos yarn, woven and interwoven with a base of the toughest brass wire mesh. There's real resistance to heat, friction, gas and oil in the special "proofing" process we use.

You will find that a TESTBESTOS job pays in satisfied customers. If you don't know where to get TESTBESTOS send us the coupon.

AMERICAN ASBESTOS COMPANY, Norristown, Pa.

### THE TESTBESTOS GUARANTEE

If any piece of TESTBESTOS Brake Lining fails to give absolutely satisfactory service, return it to us and we will send you a new piece without charge.

**BRAKE INSPECTION—  
—YOUR PROTECTION**

REG. U.S. PAT. OFF.  
**TESTBESTOS**  
AUTOMOBILE  
BRAKE LINING

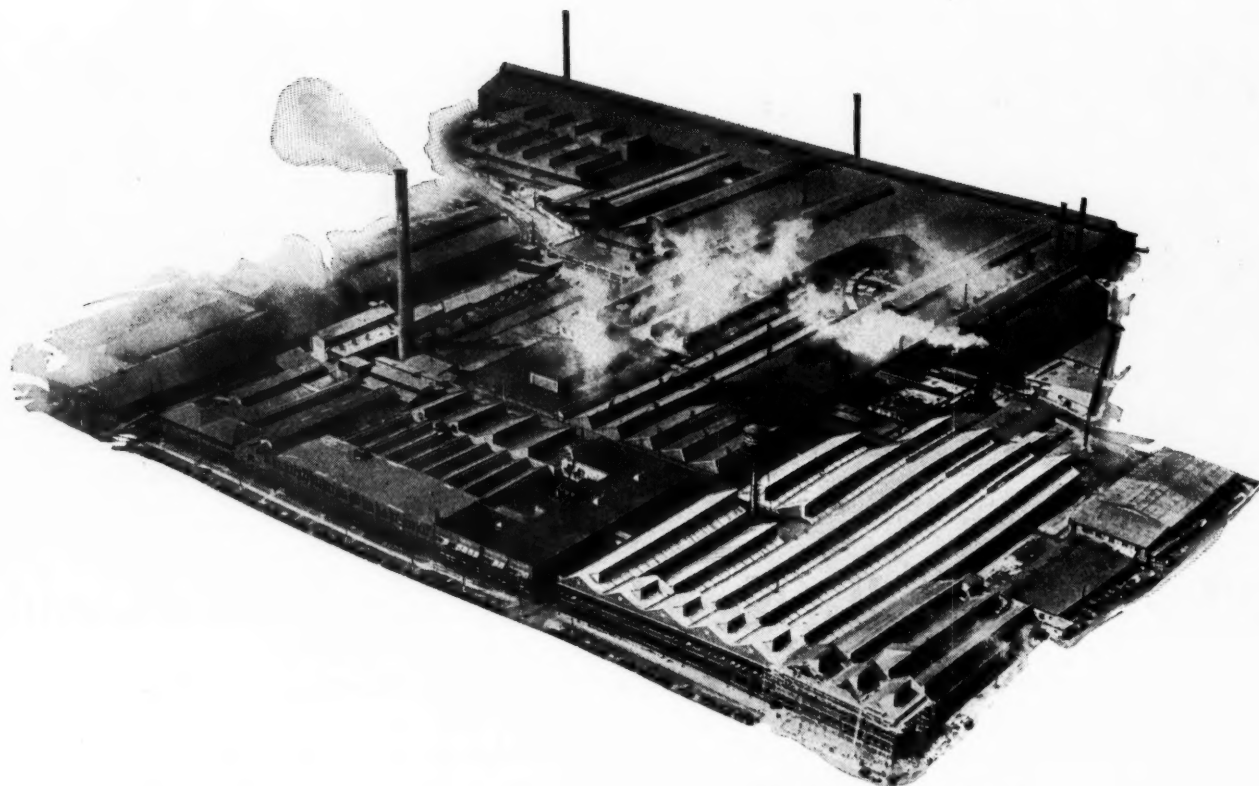
AMERICAN ASBESTOS COMPANY  
Norristown, Pa.

Please send me the name of the  
nearest TESTBESTOS jobber.

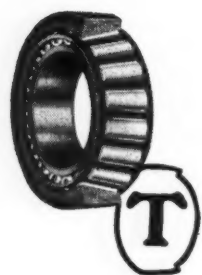
Name .....

Address .....





*The Main Timken Plant  
—Canton, Ohio*



# TIMKEN

*Tapered*

# ROLLER BEARINGS

# 100,000,000

## —and where they go from here—

100,000,000 Timken Tapered Roller Bearings have been manufactured.

For the real meaning of figures so immense, picture the rush hour on Fifth Avenue, or on Michigan Boulevard. Realize that nine of every ten cars you see there use Timken Bearings in one or more important locations. And this proportion holds true all over the world.

For the real meaning of 100,000,000 Timken Tapered Roller Bearings consider that they are supplied to an overwhelming majority of all makers of cars, trucks, and tractors — over 400 manufacturers in America and Europe—and to hundreds of builders of machinery and industrial appliances.

Picture five great plants — at Canton,

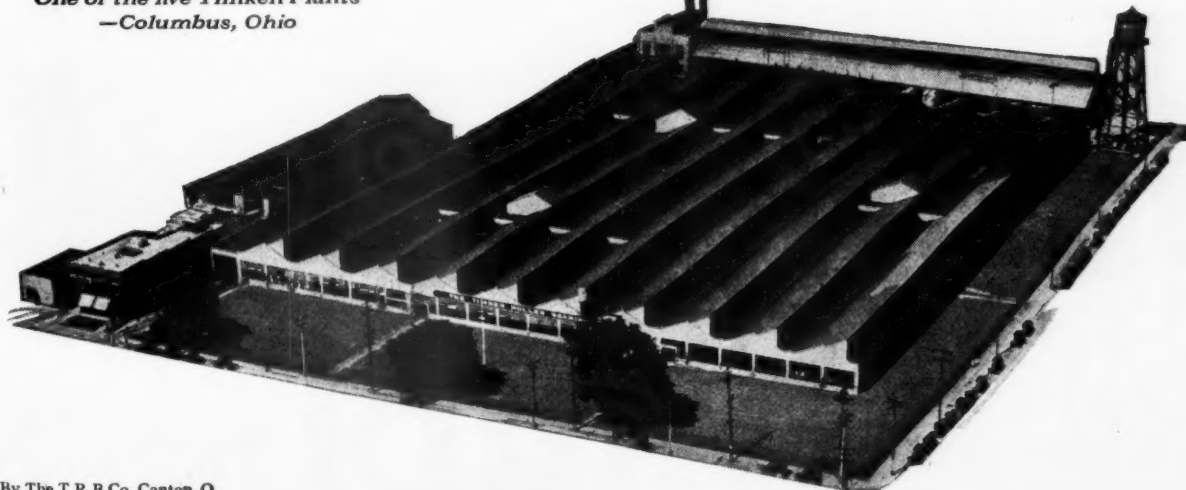
Ohio; Columbus, Ohio; Walkerville, Canada; Birmingham, England; and Paris, France — required to produce the ever-increasing volume of Timkens.

The experience accrued in the manufacture of 100,000,000 bearings is obviously of intense value to the user of Timken Bearings; experience which is the actual backbone of a dependable source of supply — experience which guarantees the ultimate satisfactory performance of the product.

Here is by far the greatest bearing industry. It is founded on the satisfaction of selling and owning Timken-equipped products.

**The Timken Roller Bearing Co**  
CANTON, OHIO

*One of the five Timken Plants  
—Columbus, Ohio*





## CARS REGULARLY EQUIPPED WITH GABRIEL SNUBBERS

Cadillac	Jordan	Paige 6-70	Willys-Knight	Buick	Stanley Steamer
Packard (Single Six)	Anderson	Courier	Kissel	Premocar	Stevens-Duryea
Pierce-Arrow	Apperson	Davis	King	Riddle Hearse	Westcott
Studebaker (Big Six)	Auburn (Big Six)	Elcar	LaFayette	Sayers	Wills Ste. Claire
Hupmobile—Closed	Case	Hatfield	McFarlan	Standard	Morris-Cowley
	Cole	Henney	Milburn Electric	H. C. S.	

## CARS WITH FRAMES DRILLED FOR GABRIEL INSTALLATION

Dodge	Maxwell	Studebaker (Little 6)	Oldsmobile	Oakland	Durant—4
Chalmers	Auburn (Little 6)	Cleveland	Essex	Kline	Reo Speedwagon
Hudson	Brockway Speed Truck	Columbia	Flint	Lexington	Star
Hupmobile—Open	Buick—6	Dort	Gardner	Liberty	Stephens
Studebaker (Special 6)	Buick—4	Earl	Gray	Moon	Velie
	Chandler	Elgin	Jewett	Reo	

*Duplication of names in above lists is due to some manufacturers equipping certain models with Gabriel Snubbers and preparing the frames of other models for Gabriel Installation.*

## Selling Satisfaction Is What Builds Permanent Business

The motor car dealer has learned thoroughly that to build a sound, profitable business, he must keep the customer satisfied.

The customer is satisfied in direct ratio to how well his car performs, as well as in his avoidance of the annoyances due to frequent servicing.

A car equipped with Gabriel Snubbers requires less service attention. It is not subject to the necessity for minor adjustments caused by unrestricted road shock.

It rides much easier and assures the owner more complete driving satisfaction.

Therefore, the dealer who urges the installation of Gabriel Snubbers, or installs them himself, makes certain of greater owner satisfaction. He also makes an excellent profit when he installs Gabriels.

Car dealers generally will be interested in the Gabriel sales plan for 1924. Communicate with the Gabriel distributor in your territory or write us direct.

### GABRIEL MANUFACTURING COMPANY

1450 East 40th Street • Cleveland, Ohio

Gabriel Manufacturing Co. of Can., Toronto, Ont.

☞ Sales & Service Everywhere ☞

### GABRIEL SNUBBERS

Gabriel is the only spring control device officially, by patent and copyright, entitled to the name *Snubbers*. To make certain that you have genuine Gabriel Snubbers installed on your car, go to the authorized Gabriel Snubber Sales and Service Stations which are maintained in more than 1700 cities and towns. Motor car dealers who are desirous of assuring their customers of greatest satisfaction recommend Gabriel Snubbers and many of them install them as well.

# Gabriel

Greater  
Riding  
Comfort

# Snubbers



# Sell this 27-tool Motor Kit to the man who likes to take care of his car himself

WITH this set a motorist can make all sorts of emergency repairs and save himself time, trouble and expense.

The tools are contained in an extra-heavy leather-bound canvas case. Held in place by strong leather straps. Each tool is a *good* tool—made by the best toolsmiths in America.

Kit consists of the following tools:

Rim Wrench	Combination Pliers
Ball Peen Hammer	Two pin Punches
Five Screw-drivers	Cold Chisel
Thickness Gauge	Cup Punch
Cape Chisel	Center Punch
Half round Chisel	Three Double-end Wrenches
6 in. Three-square File	Cotter Pin Puller
Prick Punch	Two Adjustable Wrenches
8 in. Flat File	Solid Punch
8 in. Round File	

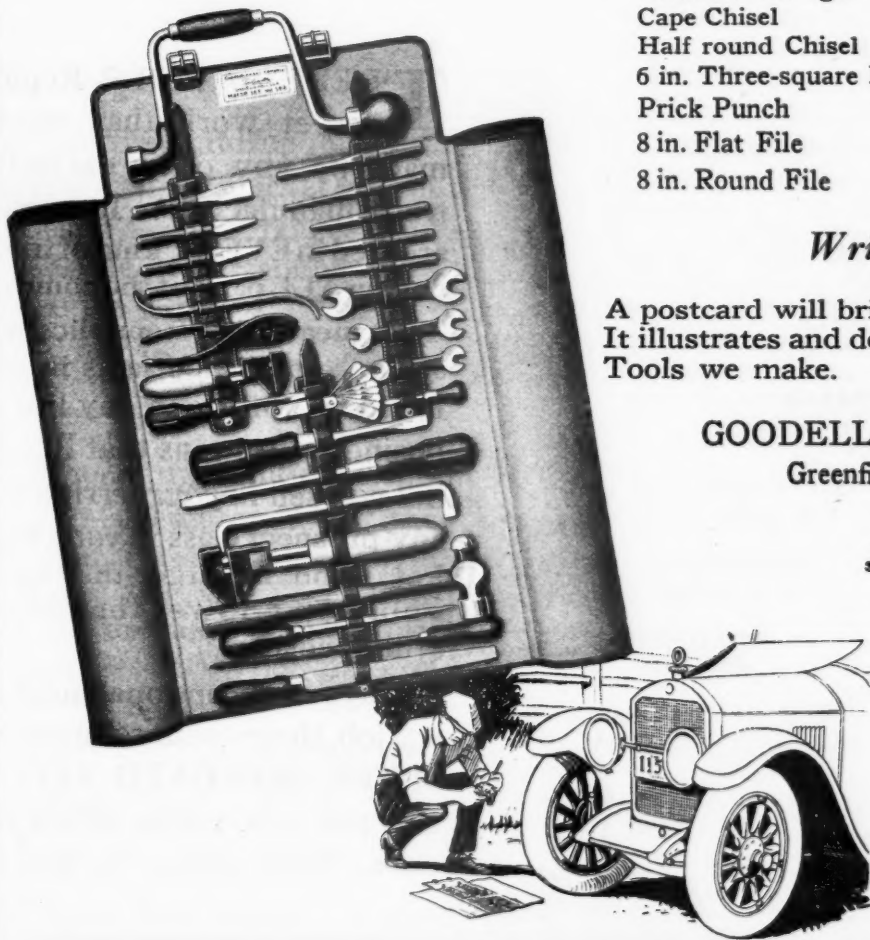
*Write for catalog*

A postcard will bring our catalog No. 15 to you. It illustrates and describes each of the 1500 Good Tools we make.

GOODELL-PRATT COMPANY  
Greenfield, Mass., U. S. A.

*Toolsmiths*

This tool kit makes a compact, handy outfit for the garageman and mechanic. In it are the tools necessary for every-day use.



# GOODELL-PRATT

## 1500 GOOD TOOLS



# REPUBLIC

VETERINARIES  
USE THEM

LAUNDRIES  
USE THEM

CIRCUSES  
USE THEM

PAINTERS  
USE THEM

FARMERS  
USE THEM

FISHERIES  
USE THEM

EVERYONE  
USES THEM

ELEVATORS  
USE THEM

BINDERIES  
USE THEM

CATERERS  
USE THEM

SILK MILLS  
USE THEM

LIBRARIES  
USE THEM

SURVEYORS  
USE THEM

CEMETERIES  
USE THEM

BILLPOSTERS  
USE THEM

STOCKYARDS  
USE THEM

CLEANERS  
USE THEM

FLORISTS  
USE THEM

FLOUR MILLS  
USE THEM

EXCAVATORS  
USE THEM

BOTTLERS  
USE THEM

COTTON MILLS  
USE THEM

## *What if YOU be a Republic*

**T**HERE are MORE Republics at work than trucks made by any other exclusive truck manufacturer. Republics are used in EVERY kind of truck duty in ALL parts of the country.

That means that Republics will sell on established facts in any territory, for use in any line of business. It means that Republics will sell in *your* territory to any prospect class in *your* market. And in larger-than-usual volume at lower-than-usual selling costs.

Always an exceptional mechanical job, the present refinements of THE IMPROVED REPUBLIC put it in a new efficiency class. From engine to brakes,

RESTAURANTS  
USE THEM

PLASTERERS  
USE THEM

MASONS  
USE THEM

ALL LINES  
USE THEM

CHANDLERS  
USE THEM

DRILLERS  
USE THEM

TANNERS  
USE THEM

WRECKERS  
USE THEM

BUTCHERS  
USE THEM

NURSERIES  
USE THEM

CLOTHIERS  
USE THEM

BUILDERS  
USE THEM

BAKERS  
USE THEM

POLICE  
USE THEM

PLUMBERS  
USE THEM

HOISTERS  
USE THEM

WAREHOUSES  
USE THEM

PAPERS  
USE THEM

FOUNDRIES  
USE THEM

PRINTERS  
USE THEM

GROCERS  
USE THEM

QUARRIES  
USE THEM



We have one Model 11X Republic, purchased over five years ago, which we have used for transfer work and hauling oil well casings. Upon the performance of this truck we purchased the Model 19A from you about a month ago.

We find Republic trucks for our work the best we have ever used, and do not hesitate to recommend them in any kind of work for low cost hauling, and they are always on the job.—Reinhart & Read, Princeton, Indiana

## could Dealer?

everything has been bettered.

The full five-unit Republic line brings the entire market within the dealer's selling range. And present energetic Republic control, supported by powerful finances and unequalled experience, is directing Republic to new triumphs.

Republic representation is always considered as among the few highest class connections in the truck market. You know how seldom such a possibility presents itself. What if *YOU* could be a Republic dealer? Why not find out? Write to us.

REPUBLIC MOTOR TRUCK CO., INC.  
Alma, Michigan  
*More Trucks in Use than any other  
Exclusive Truck Builder*

# Yellow Chassis Trucks



# GATES BELTS

*"The Standardized Fan Belt"*



FIG. 1.

Ordinary fan belt. Threads run lengthwise and across. To break this belt on the marked line only the lengthwise threads need be broken.

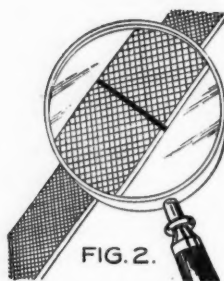


FIG. 2.

Gates Vulco Belt. Threads run diagonally. To break this belt every thread must be broken. This bias weave construction is patented.

Such a simple little thing, this **bias weave** construction—but it's **patented**. That's why Gates Vulco Belts have outsold all other kinds for seven consecutive years.

Made by the World's Largest  
Manufacturers of Fan Belts.

# A Good Hone

The Primary Requirements  
of any  
Motor  
Recon-  
ditioning  
Plant

## and A Reliable Means of Operation



### STORM HONE

Instant adjustment for all cylinders. Speedy and efficient in operation. Perfect "Gun Barrel" finish produced; proper grinding tension for any and all diameters; absolute self centering; fast cutting and perfect balance of pressure. Takes all sizes 2 3/4 to 8 in. Complete and with extra stones for fast grinding \$40.25.

The Storm Hone constitutes full Honing Equipment for any shop. It fulfills every requirement. One tool takes all sizes from 2 3/4 to 8 in.

The Honing Process is the first step towards a more complete service. It is the stepping stone to greater profits. It opens a new field of profit in Replacement Parts, Pistons, Rings, Pins, Bushings, etc.

Honing eliminates slow, tedious lapping and may be used alone for correcting wear efficiently within certain limits. Ideal for re-conditioning cylinders not too badly worn. It handles an important part of your cylinder work; but do not expect the impossible from the Honing Method alone. There is a point in cylinder wear where Honing alone becomes inefficient and unsatisfactory. Do not use it beyond this point.

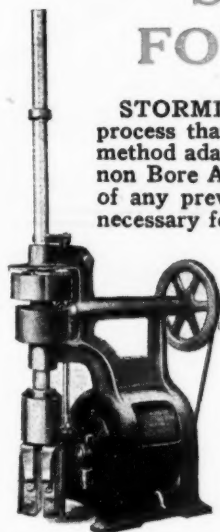
For your heavier wear—for your complete cylinder re-conditioning or re-manufacturing under any and all conditions, you need complete CYLINDER STORMIZING EQUIPMENT. Then and only then, will you be in a position to give the complete service that your customers will eventually demand.

## STORMIZING MACHINES FOR ALL CYLINDER WORK

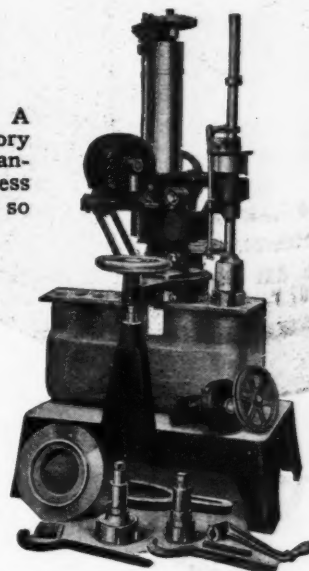
STORMIZING is a combined boring, honing or refined grinding process. A process that embodies speed, accuracy and efficiency. The latest approved factory method adapted to service work conditions. It insures a straight new bore of "Cannon Bore Accuracy," a perfect new cylinder "square with the crankshaft" regardless of any previous badly worn condition. Finishing with that Gun Barrel Polish so necessary for lasting satisfactory service.

With a Stormizing Machine in your shop you handle all your cylinder work efficiently. The lighter wear being taken care of by the honing method alone and the heavier wear by the efficient combined boring, honing or grinding process. With this equipment installed you render a complete accurate cylinder service and keep all the profit yourself.

Your request brings the STORM book: Modern Cylinder Methods. Send for it today.



No. 580 Finishing Machine with No. 500 Finishing Head  
Capacity, 2 3/4 to 8 in. diameter by 20 in. deep.



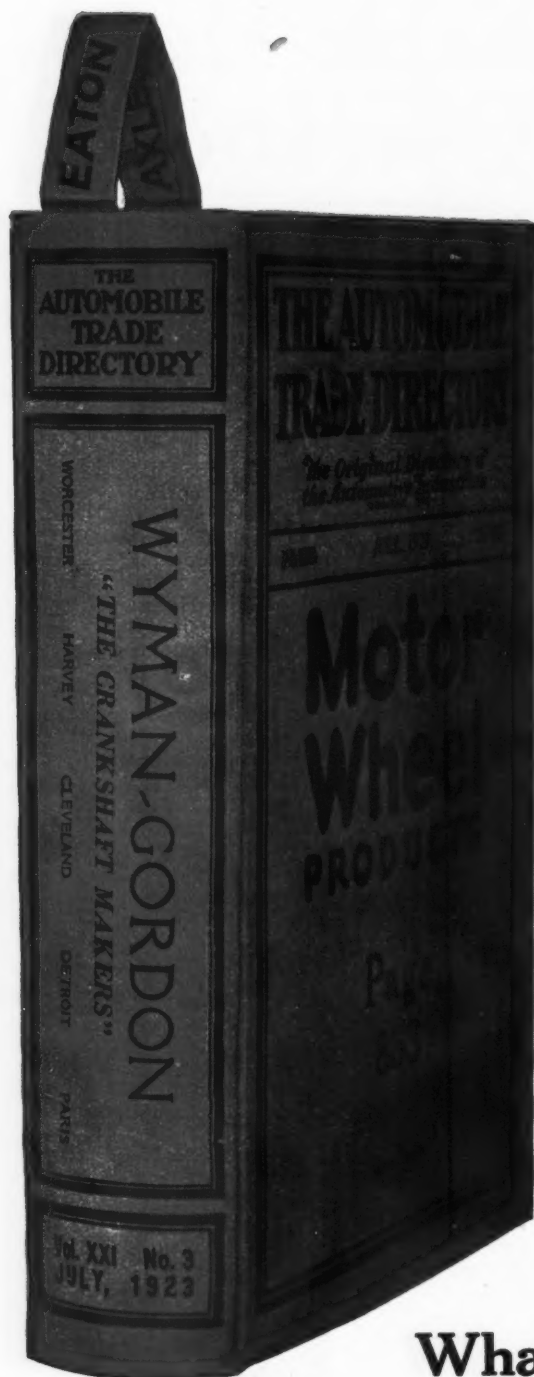
Model M Semi-Portable Machine  
Cap., 2 3/4 to 6 inches dia.  
Shipping Wt. 350 lbs.

## STORM MFG CO

406 A Sixth Ave. So., Minneapolis, Minn.



# "Makes"



224

THE AUTOMOBILE TRADE

**CHUCKS, Drill**

Almond Mfg. Co., T. R., Ashburnham, Mass. (See page 843.)  
 Brown & Co., R. H., 98 Brown St., West Haven, Conn. "Reid."  
 Cushman Chuck Co., 806 Windsor St., Hartford, Conn. "Hartford."  
 Detroit Twist Drill Co., 2108 W. Fort St., Detroit, Mich. "Graham."  
 ✓ Eastern Tube & Tool Co., Brooklyn, N. Y. "Ettco." (See page 879.)  
 Ettco—See Eastern Tube & Tool Co.  
 Goodell-Pratt Co., Wells St., Greenfield, Mass.  
 Graham—See Detroit Twist Drill Co.  
 Hartford—See Cushman Chuck Co.  
 Horton & Son Co., E., Windsor Locks, Conn. "Morrow."  
 ✓ Jacobs Mfg. Co., 2047 Park Rd., Hartford, Conn. (See page 225.)  
 Little Giant—See Westcott Chuck Co.  
 McCrosky Tool Corp., S. Main St., Meadville, Pa. "Wizard."  
 Magic—See Modern Tool Co.  
 Millers Falls Co., Millers Falls, Mass. "Star."  
 Modern Tool Co., Fourth & State Sts., Erie, Pa. "Magic."  
 Morrow—See Horton & Son Co.  
 Morse Twist Drill & Machine Co., 163 Pleasant St., New Bedford, Mass.  
 Pratt Chuck Co., Frankfort, N. Y. "Pratt-Onelda."

Miller  
 "Sta"  
 Pratt  
 One  
 Pratt  
 Skinn  
 Bri  
 Star  
 Sweet  
 Co.  
 T-W  
 Terkel  
 Mass  
 Union  
 Brit  
 West  
 N.  
 White  
 St.,

**CHUC**

✓ Heald  
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 Simme  
 Taft-F  
 Wop  
 Walk  
 Mas



What you  
 want to know  
 is in  
 the **RED** Directory



A CLASS JOURNAL  
 PUBLICATION

# is it Easy to Buy?"

THE one and only purpose of the Red Directory is to make your buying convenient.

Instead of rummaging through hundreds of catalogs for buying information, you look in the all-in-one source—the Red Directory. There, indexed for your ready reference, is listed every product and every manufacturer in the automotive field—under two covers.

And for your benefit, many manufacturers provide a condensed catalog of their product so that you can order right from the Red Directory.

See what the Jacobs Manufacturing Company does to save your time when you need a drill chuck. All the information is there—sizes, specifications, order numbers and prices. All you have to do is order. No trouble. No delay.

**What the  
buyer finds  
on page 225**

## THE AUTOMOBILE TRADE DIRECTORY

"The Red Directory"

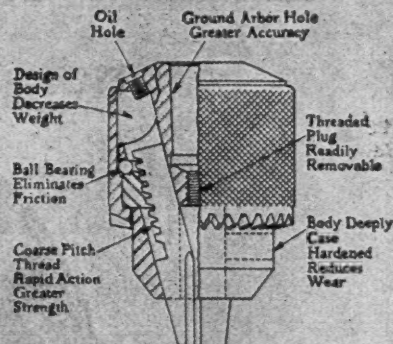
239 West 39th St. New York

No time lost writing for information. No delay in locating the nearest source of supply. The Red Directory is an encyclopedia of Buying—a thousand catalogs in one—it is your best source of buying information.

## JACOBS CHUCKS



Exterior View Jacobs Chuck



Sectional View Jacobs Super-Chuck

Careful selection of Drill Chucks with reference to the use to which they are being placed will result in a great saving to the user—not only in the item of chucks, but in the larger one of Drilling Machine maintenance and Drill breakage. The recommendations contained on this page are the results of the combined experience of the Drill, Drilling Machine and Chuck Manufacturer.

**JACOBS IMPROVED DRILL CHUCKS** for general drilling purposes on: Drill Presses, Lathes, Tapping Machines, Radial Drills, Wall Drills, Blacksmith Drills.

Model	Capacity	List Price
7	1/4"	\$4.50
2	5/16"	5.50
32	3/8"	5.50
3	1/2"	9.00
4	3/4"	15.00
5	1"	20.00

**JACOBS IMPROVED LIGHT WEIGHT CHUCKS** are recommended on the following: Sensitive Drills, Jewelers' Drills, Precision Lathes, Multiple Drills, Drill Heads, Tapping Devices.

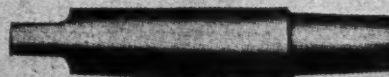
Model	Capacity	List Price
0	1/8"	\$5.50
1	13/64"	4.50
1A	1/4"	4.50
30	5/16"	5.50
2A	3/8"	5.50
6A	1/2"	9.00

**JACOBS CHUCKS FOR PORTABLE ELECTRIC DRILLS.** As Portable Electric Drills have been designed for both light and heavy duty drilling the specifications of the manufacturer should be followed wherever possible. Jacobs Chucks are standard equipment on nearly every portable tool made in America and many of those made abroad. Chucks can be furnished with threaded arbor holes to fit any spindle without additional charge. When ordering Chucks just specify the capacity and thread required or furnish the manufacturer's drill model number.

**THE JACOBS SUPER-CHUCK** is recommended for general drilling purposes where hard and constant usage demand the greatest possible efficiency from a Drill Chuck. On production drilling it will outwear any chuck ever made. The Gripping Power of the SUPER-CHUCK is such that only a slight pressure is required on the key for the heaviest drilling. For ordinary drilling and tool work the Chuck may be tightened by hand without using the key.

Model	Capacity	List Price
8	1/4"	\$7.50
9	5/16"	8.00
11	3/8"	9.00
12	1/2"	12.00
14	1/2"	12.00
16	5/8"	15.00
18	3/4"	18.00
20	1"	25.00

### ARBORS FOR JACOBS CHUCKS



Arbors are regularly furnished to fit all standard makes of machine tools. Being accurately ground on centers, Jacobs Arbors insure an accurate running Chuck. **PRICE LIST OF ARBORS TO FIT any MODEL of the JACOBS CHUCK**

Model	Price
No. 1 Morse	\$1.80
No. 2 Morse	.80
No. 3 Morse	1.20
No. 4 Morse	2.00
No. 5 Morse	2.50
1/2" Straight Shank	.75
41/64" Straight Shank	.75

**The Jacobs Mfg. Company, Hartford, Conn.**  
2047 Park Road



## Why Lose that Sale to a Competitor?

**I**T is true that the men who sell cars having Perfection Heaters as standard equipment find a distinct advantage in closing sales.

If the cars you handle are not as yet equipped with Perfection Heaters you are missing the big appeal of year 'round comfort.

Dealers whose cars are not equipped

meet the demand for comfort by installing a Perfection Heater in their demonstrator. It proves a real sales aid and adds to the profit on each sale.

Every car brought to your shop for service is another profit opportunity for you. Its owner knows Perfection Heaters and the driving comfort they afford.

Order from your jobber.

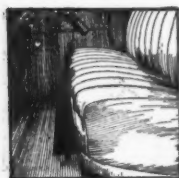


"The heat is there—why not use it?"

# PERFECTION MOTOR CAR HEATERS

THE PERFECTION HEATER & MANUFACTURING CO.  
6545 Carnegie Avenue Cleveland, Ohio  
Manufactured in Canada by  
Richards-Wilcox Canadian Co., Ltd., London, Ont.

IMPORTANT



These manufacturers provide real winter driving comfort by equipping their closed models with Perfection Heaters without extra charge.

Auburn	Flint-6	McFarland	Standard "8"	Taxi Cab
Buick 4-Cyl.	Fox	Moon	Stephens	Equipment
Buick 6-Cyl.	Gardner	Nash 4-Cyl.	Sterling	
Case	Henney-6	Nash 6-Cyl.	Knight	
Cunningham	Hupmobile	National	Stevens	
Dorris	King	Oakland	Duryea	Anchor Top &
Duesenberg	Kissel	Paige	Studebaker	Body Co.
Durant-4	Kline	Pilot	Veille	Barley Motor Car Co.
Earl	Mercer	Premier	Winton	Elkhart Motor Co.
Elcar	Meteor	R&V Knight		Premier Motor Corp.
				Rauch & Lang, Inc.
				Yellow Cab Mfg. Co.

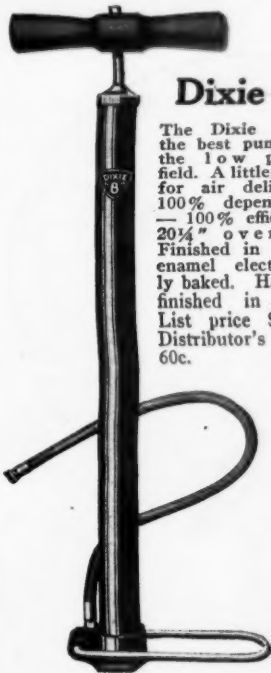
The real works of an automobile heater are hidden under the floor. You can't SEE the quality. Your Safeguard is the Perfection nameplate which you will find on every Perfection Heater.



# Get Behind the Fastest Movers



## Kentucky Thoroughbred Auto Accessories



### Dixie B

The Dixie B is the best pump in the low priced field. A little giant for air delivery. 100% dependable — 100% efficient. 20 1/4" over all. Finished in black enamel electrically baked. Handle finished in red. List price \$1.25. Distributor's price 60c.

### Coil Special

The Coil Special is a quality pump at a medium price. It has the same general specifications as its big brother, the Kentucky Thoroughbred, and lacks only the patented features. Handle finished in black. List price \$2.50. Distributor's price \$1.25.



### Kentucky Thoroughbred

The Kentucky Thoroughbred takes the "umping out of pumping;" it is characterized by exclusive patented features. Intake of air is through a valve in the handle. This air passes oilless and clean into inner tube. Every downward stroke delivers a full cylinder of air—no half compression—no lost motion. Base cast with folding foot loop nickel plated. Finished in black enamel electrically baked. Handle red enamel finished. A quality pump throughout. List price \$4.00. Distributor's price \$1.90.



All pumps equipped with our special oil saturated, non-drying-out cup leather, developed and exclusively used by us.



Kentucky Thoroughbred quality cast aluminum step plates, massive, beautiful and artistic; especially designed for medium and high grade cars; also proportionately made for Fords, Chevrolets, Overlands, Stars, etc. Made in several sizes and styles including rubber mats, plain and solid and without kick plate. Write for full descriptive circular including price.



Kentucky Thoroughbred 17", twelve cornered Polygon, corrugated, solid walnut steering wheels for Fords, Chevrolets and Stars. Also round corrugated, 12" and 16" Polygon corrugated, dished, highest quality wheels. For Fords \$1.85 up; for Stars \$2.25 up; for Chevrolets \$2.50 up; retailing at \$5.00 and upwards.

Ask for our special sample shipment of pumps, comprising 6 Dixie B's, 2 Coil Specials and 2 Kentucky Thoroughbreds. Pay your postman \$9.90 with full assurance that your money will be returned if you are not satisfied with the merchandise. Join the ranks of progressive dealers who are building good will and profits with Kentucky Thoroughbred Products.

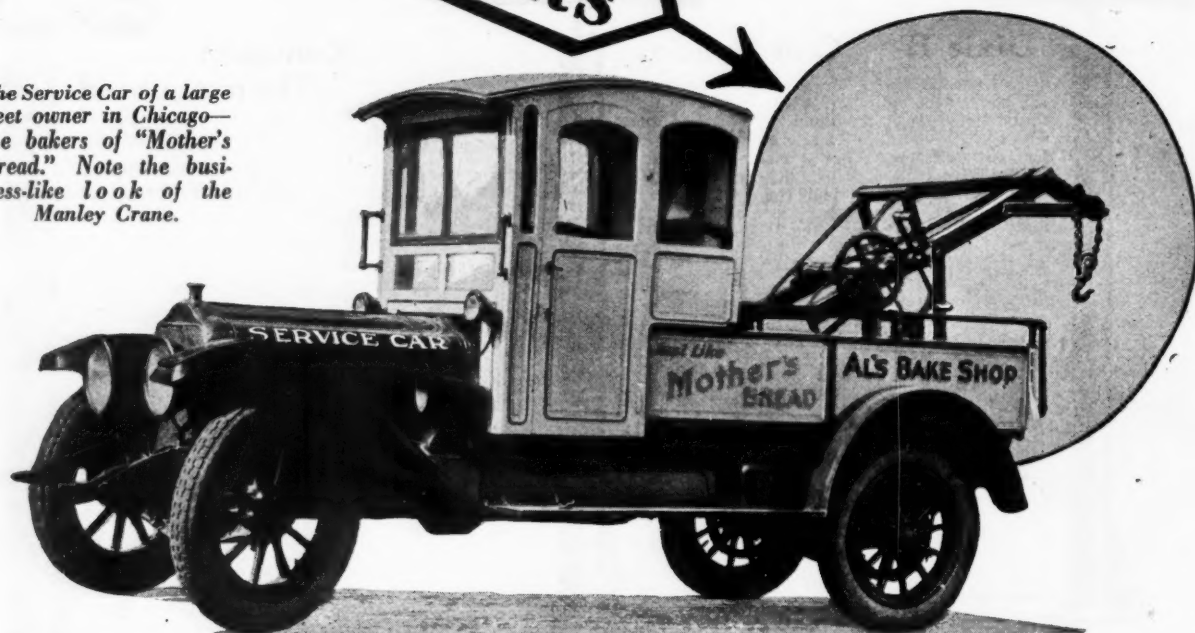
Address all Communications to Dept. G

## Kentucky Pump Mfg. Co., Evansville, Ind.





The Service Car of a large fleet owner in Chicago—the bakers of "Mother's Bread." Note the business-like look of the Manley Crane.



## The Wrecking-Crane for your Service Car

Note the position of the MANLEY Wrecking Crane on the car. Not away back toward the rear edge of the platform, but WELL FORWARD of the axle. This is one secret of the greater lifting power of the MANLEY.



Fleet owners can't waste time—their service cars *must* be equipped with a wrecking crane that can "get" any car in the fleet in **THE SHORTEST POSSIBLE TIME AND WITH THE FEWEST NUMBER OF MEN.**

The MANLEY meets this condition 100%. There are no BENT structural steel members in the Manley Crane. Everything is STRAIGHT for strength. The top extension is DETACHABLE by removing two nuts. The Crane Beam tilts at any angle—permitting hitches impossible with ordinary cranes. There are FOUR different leverages.

The Crane mounts on any chassis by the use of common bolts. Comes off in three minutes for use around the repair floor. This makes the Manley two cranes in one.

Three sizes—two 2-ton and a 5-ton for trucks. Special crane bulletin mailed to any address.

MANLEY MFG. CO., York, Pa.

# Get a Manley

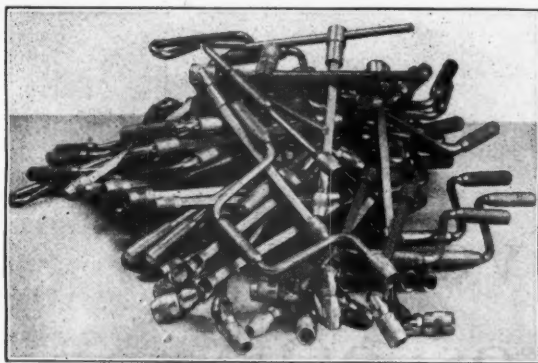
# Pictorial Proof!

Here is a Snap-on Kit, specially selected for Buick owners. It contains just 11 Snap-on units—a handful!

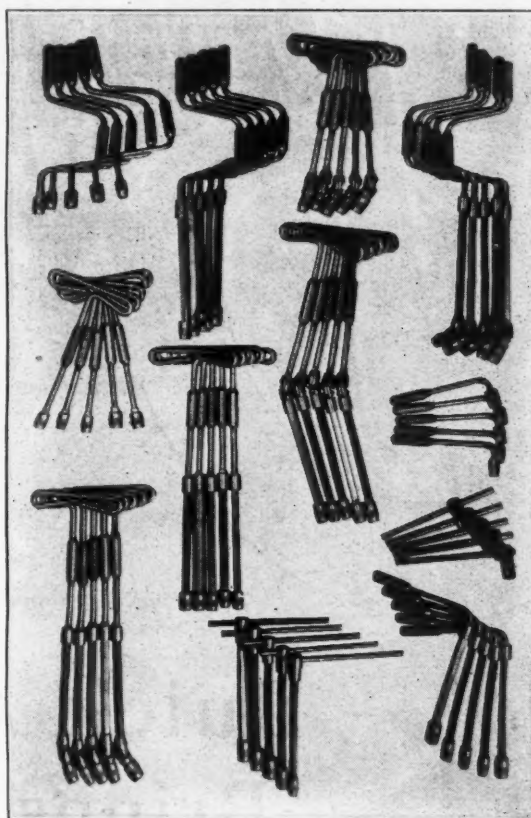


Packed in a Leatherette Kit Bag, this Kit makes a flat, compact package that stows conveniently under the seat.

**T**HE Buick Kit above, trim, strong, designed and made by skilled mechanics of special steels, can be built up into every one of the 60 combinations at the right. Each combination replaces a solid-handle wrench at a relative cost of 15 cents each, as against a relative cost of 75 cents. Below is an 80-pound, \$50 heap of wrenches that will accomplish even less than the Buick Kit which replaces it for a few dollars. Other Snap-on Kits do the same thing for all cars. Write us for details as to how much you can make per Kit, and you can quickly figure how much you ought to make in your community, with this great story to assure sales to nine inquiries in every ten.



Car owners would like the utility represented above, without the bulk and cost. They find it and buy it in Snap-ons.



60 socket wrenches, made simply by duplicating 11 Snap-on units! Here is a service you can't help selling.

**MOTOR TOOL SPECIALTY COMPANY**

14 E. Jackson Blvd., Chicago

**SNAP-ON WRENCH COMPANY, Mfrs.,**

Milwaukee, Wisconsin

NEW YORK  
AUTO SHOW  
28th F. A.  
ARMORY  
SPACE 119,  
MAIN FLOOR  
JAN. 5 to 12

# Snap-on

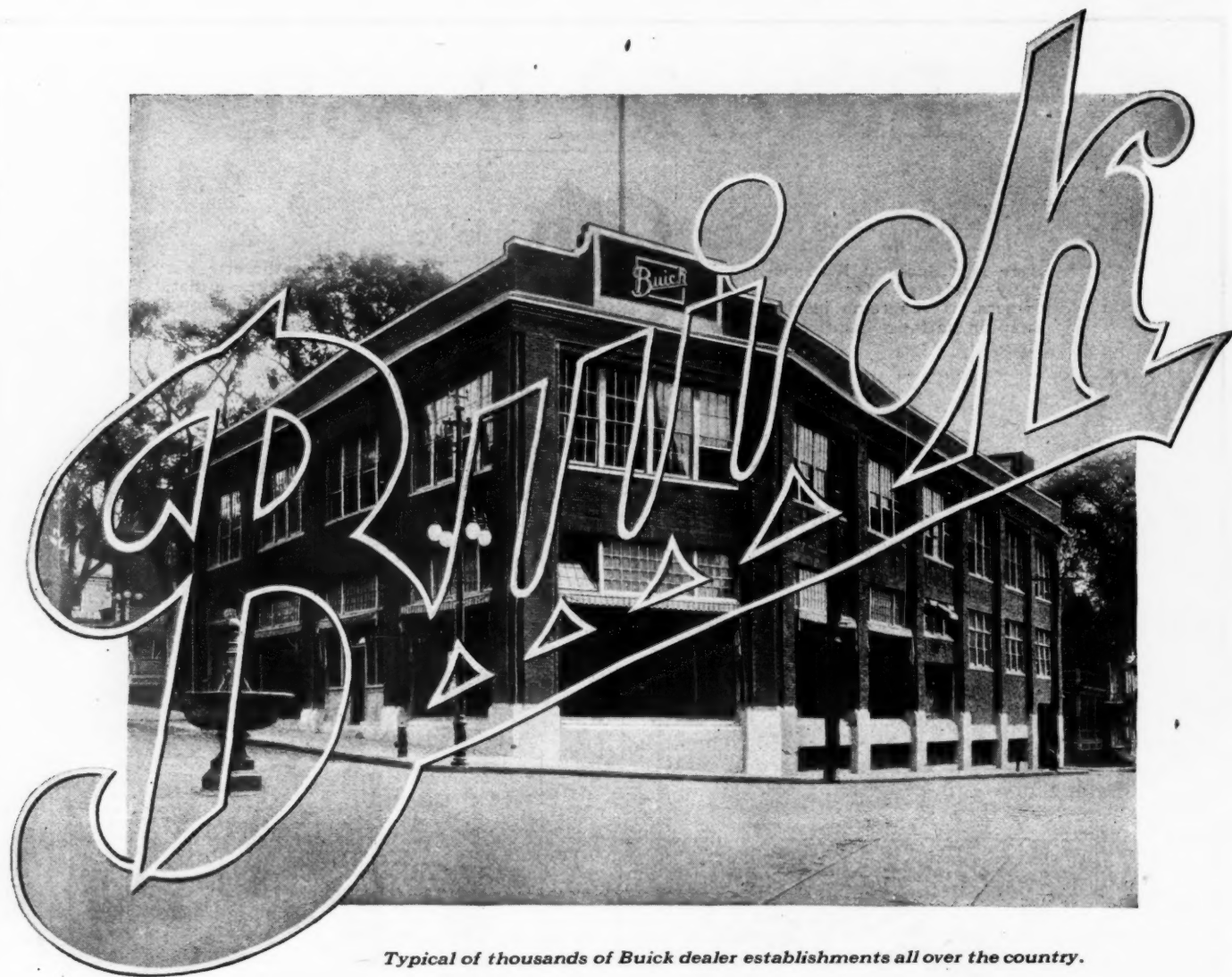
CHICAGO  
AUTO SHOW  
COLISEUM  
ANNEX  
BASEMENT  
JAN. 26-FEB. 2

**INTERCHANGEABLE**

# Socket Wrenches

"The Greatest Service From the Fewest Tools"





*Typical of thousands of Buick dealer establishments all over the country.*

## Buick Advertising Brings Prosperity

Buick advertising is one of the many ways in which Buick helps its dealers to make money. National magazines, farm papers together with hundreds of newspapers are carrying the Buick story to every corner of the country. Everywhere this advertising is helping Buick dealers to make more sales and greater profits. Buick advertising is one of the reasons why Buick dealers are prosperous. Why not have your name on file?

**BUICK MOTOR COMPANY, FLINT, MICHIGAN**

*Division of General Motors Corporation*

Pioneer Builders of Valve-in-Head Motor Cars

Branches in All Principal Cities—Dealers Everywhere

---

**WHEN BETTER AUTOMOBILES ARE BUILT, BUICK WILL BUILD THEM**

---

# Make Big Money This Xmas

## BOSCH

Ignition  
System

TYPE  
600

**\$12<sup>75</sup>**  
and tax



Power and Speed Maker for

## FORDS

### Every Ford Owner Needs Bosch Ignition

Hundreds of Christmas gifts will be bought for Ford Owners in your town this month—

Wives, daughters, uncles, aunts and friends are all trying to select suitable gifts right now—

That's your opportunity!

Make a display of Bosch-Ford Ignition Systems in your show window, on your counters, and in your garage—feature the Bosch System in your newspaper ads and sales letters—

You'll make big money if you show Christmas shoppers what a wonderful improvement the Bosch System makes in Fords—

Wire our nearest branch for display cards, posters, sales aids, and a stock of Bosch-Ford Systems.

Make this a big dividend-paying Christmas.

**AMERICAN BOSCH MAGNETO CORP.**

Main Office and Works: Springfield, Mass.

**BRANCHES:**

NEW YORK  
17 W. 60th St.

CHICAGO  
3737 Michigan Ave.

DETROIT  
5310 Woodward Ave.

SAN FRANCISCO  
1262 Post St.





# A Good Bumper Should Have Good Attachments

The reputation of a bumper may easily be damaged by poor-fitting, easily loosened, rattling attachments. Skill and experience in tempering steel and designing bumpers are not the only features that have upheld Gemco's enviable position in the esteem of motorists and dealers.

Gemco attachments reflect our many years' experience as bumper manufacturers and our integrity in precise workmanship. They attach easily and hold as fast as if they were a part of the car's original design and assembly.

Dealers who appreciate their responsibility to the customer will realize the importance of this Gemco thorough quality.

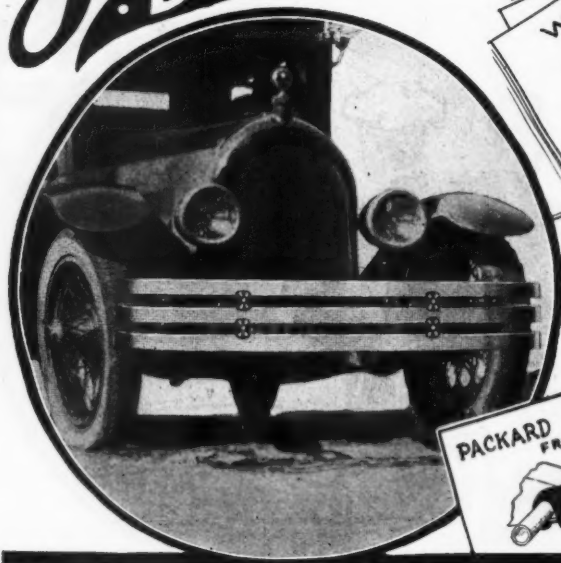
## Brackets for all Cars Including 1924 Models

We want every dealer to have our new catalog No. 31 of bumper information. It shows our complete line of bumpers for all cars, describes our "guaranteed-to-fit" attachments for all cars including the new 1924 models. The Bumper Recommendation charts in this catalog are very complete and up-to-date. You will find it a valuable aid in outfitting your bumper trade.

Write for Copy of this  
Free Book—Prices and  
Dealer Discounts.

**GEMCO MANUFACTURING CO.**  
760 So. Pierce St. Milwaukee, Wis.

# Gemco BUMPERS.



Para-Mount—  
Model AX, 1 1/4-in. steel, Nickel \$32.00

Para-Mount—  
Model B, 2-in. steel, Nickel \$25.00  
Model C, 1 1/4-in. steel, Nickel 22.00  
Model D, 1 1/2-in. steel, Nickel 19.50

Para-Flux, 1 1/4-in. steel, Nickel \$16.00  
Para-Flux, 1 1/2-in. steel, Nickel 14.00

Little Giant, Pull Nickel ..... \$26.00

Standard Triple-Gard, Nickel ..... \$30.50

Light Weight Triple-Gard, Nickel \$18.50

Small Kar, Nickel ..... \$15.00  
Small Kar, Black ..... 12.00



## *We Have Outgrown Three Homes in Three Years!*

**T**HREE years ago The Better Tires Company was unknown. Today, with annual sales running over \$4,500,000, the company is a recognized leader in the wholesale distribution of tires and tubes.

Its methods have been pointed out by the leading trade and business papers of the country. Big manufacturers have lauded its policies. Thousands of dealers in every State in the Union have made this institution their regular source of supply.

This phenomenal growth is but a promise of what these demonstrated methods will accomplish in the future. The principles of tire merchandising on which this business is founded are the solution of a great need in the tire industry. We fill a real want; our methods have a genuine purpose. That is why we have been successful—why we have grown so rapidly, yet so soundly—*why we have outgrown three homes in three years.*

A copy of our big wholesale catalog—“Better Tires”—will be mailed to any dealer who requests it on his business letterhead. No obligation, of course.



**OUR  
SECOND  
HOME**

OUR first “office” (insert at right) was little more than a few chairs and tables, plus an idea. Less than a year later, we moved into our second home—many times larger. Soon our rapid growth forced us to move again, this time into our present home, shown above—our new big building at Michigan Avenue and 18th Street, which we occupy exclusively.



**OUR  
FIRST  
HOME**

# The Better Tires Company

*“The House that Helps the Dealer Sell”*

**MICHIGAN AVENUE & 18TH STREET, CHICAGO, ILL.**



# What Every Dealer Should Know



Every dealer should know about the fundamental changes in the automobile industry.

Every dealer in the country should visit the Chevrolet exhibit at the Auto Show he attends.

He ought to know all about the car that holds second place in current sales nationally, and first in many places.

He ought to learn why this change took place.

He ought to decide how this condition is going to affect him.

If you call, you will discover other reasons why you were wise to do so.

*Five United States manufacturing plants, seven assembly plants and two Canadian plants give us the largest production capacity in the world for high-grade cars and make possible our low prices.*

*for Economical Transportation*



*Prices F. O. B. Flint, Michigan*

Superior Roadster - - -	\$490
Superior Touring - - -	495
Superior Utility Coupe - - -	640
Superior Sedan - - -	795
Superior Commercial Chassis -	395
Superior Light Delivery - - -	495
Utility Express Truck Chassis -	550

## Chevrolet Motor Company, Detroit, Mich.

*Division of General Motors Corporation*

# The Files that cut Production and Repair Costs

**W**HEN a brand of Files requires no "breaking in" and each File is ready-sharp from the moment it's put into use --- they save time.

When they are rugged and hold their cutting edge through thick and thin--- they call for fewer replacements.

When they cut

accurately --- they eliminate waste.

And when they cut smoothly and evenly --- they save energy.

The above features apply to every NICHOLSON File. And they are features which have won for this brand of tools the respect of mechanics and confidence of "men higher up" in automotive factories and repair shops throughout the world.

Be sure the name NICHOLSON is stamped on every File in your shop

**NICHOLSON FILE CO.**  
PROVIDENCE, R.I., U.S.A.



# NICHOLSON FILES

*~a File for Every Purpose!*





## Is "High Powered Selling" Absorbing Your Profits?

**W**E don't know to what extent you may now be suffering because of the ambitions of high-powered factory sales organizations. We do know, however, that the J. I. Case T. M. Company has no individuals on its payroll whose salary and bonus depend in any way upon their ability to stock the dealer. This eighty-one year old organization does not look kindly upon any merchandising arrangement that might result in its dealers being overstocked.

Case dealers are never obligated to take more cars than they can reasonably handle. Our factory production is gauged entirely by the ability of our dealer organization to finance and merchandise. Because of this interest in what our dealers sell, rather than what they can buy, Case dealers do not find it necessary to pay warehousing charges. On the contrary, small inventory and quick turnover is the rule, rather than the exception.

Are you as fortunately situated?

**J. I. CASE T. M. COMPANY, RACINE, WISCONSIN**



**CASE**  
**MOTOR CARS**



THE SIGN OF MECHANICAL EXCELLENCE



FOR MORE THAN EIGHTY YEARS

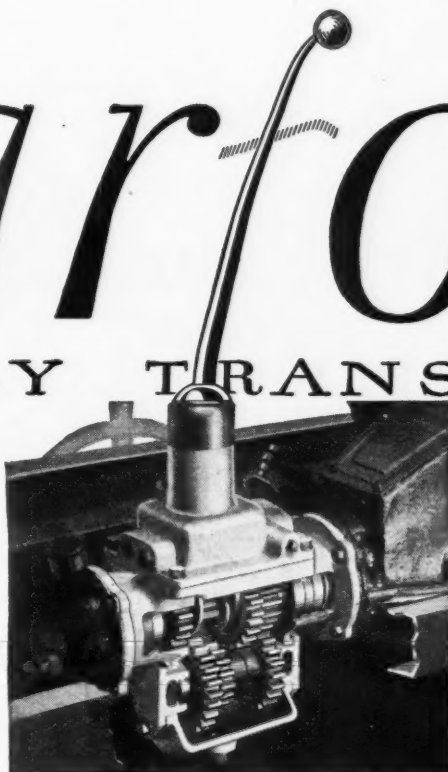
# Warford

## AUXILIARY TRANSMISSION

Aluminum  
Alloy Case

Vanadium  
Shafts

3½% Chrome  
Nickel Gears



Taper Roller  
Bearings

Quickly  
Installed

No Change in  
Ford Design

When you gear a Ford truck *under* Ford low and *over* Ford high, with a standard selective transmission giving six speeds forward—

When you price the transmission at a fraction of Ford first cost, making the total figure on this heavy-duty two-ton job more than \$1000 under any two-ton unit that will do as much—

When thousands of Warfords are saving big sums in gas, oil, tires, service and dead weight—

Is it any wonder that the Warford-equipped Ford is making big money for Ford dealers everywhere? Find out how you can do business in the two-ton market with Warford Auxiliary Transmission. Our proposition will interest you. Write.

**The Warford Corporation, 44 Whitehall St., New York**

AUBURN, N. Y.  
Foster-Warford Co.

CANTON, Ohio  
Dine-De Wees Company  
400 Walnut Ave., S. E.

CHARLOTTE, N. C.  
Warford-Hall Co.

DALLAS  
Houdaille-Polk Co.  
2218 Commerce St.

DAVENPORT, Iowa  
Sieg Company

DENVER, Motor  
Specialties Company  
17 W. 13th Avenue

KANSAS CITY  
2016 Grand Avenue

LOS ANGELES  
Warford Co.  
742 San Fernando Bldg.

MEMPHIS  
Continental Body Co.  
476 Union Ave.

MINNEAPOLIS  
McGee-White Corporation  
1311 Hennepin Ave.

NEW YORK  
Motive Parts Corporation  
796 10th Ave.

PHILADELPHIA  
Warford-Eastern Co.  
2402 N. Broad St.

PORTLAND, Ore.  
Warford Sales Co.  
432 Main St.

SAN FRANCISCO  
Warford-Pacific Co.  
1111 Post Street

SEATTLE  
Dan Swinchart  
910 East Pike St.

STOCKBRIDGE, Mich.  
Transmission Sales Co.

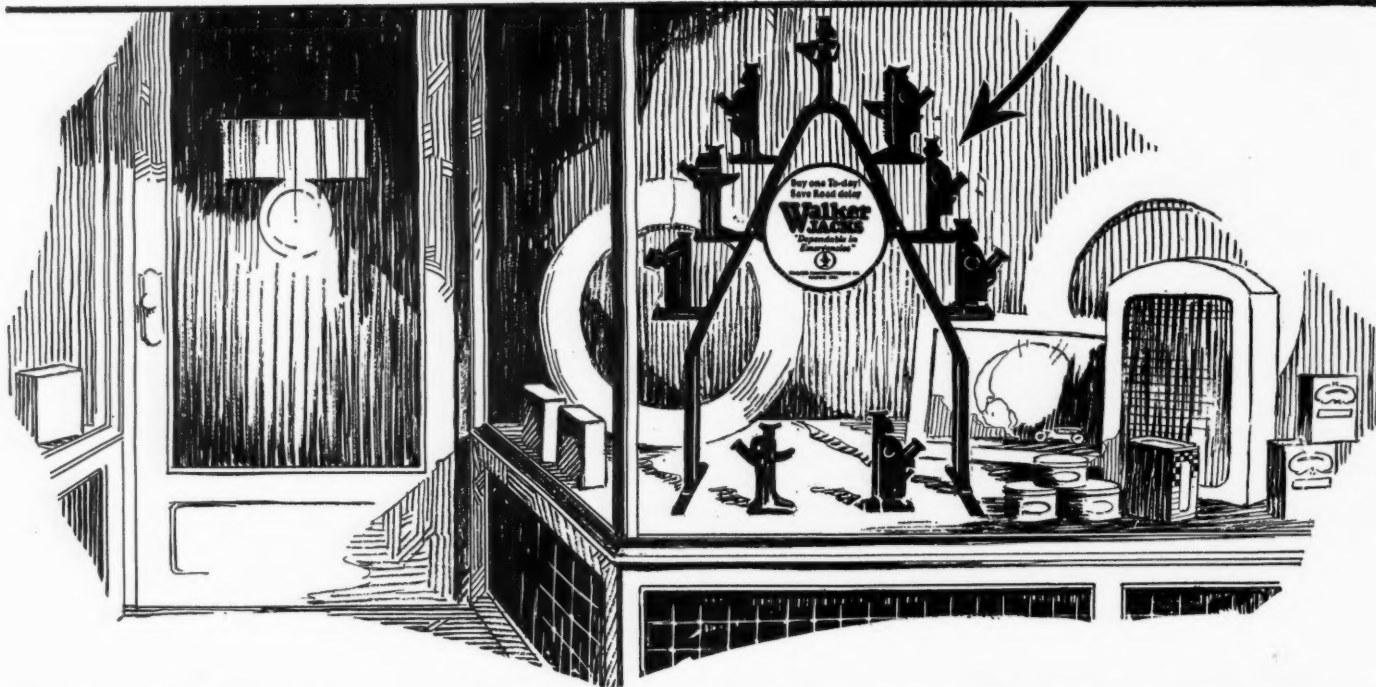
VANCOUVER, B. C.  
E. W. Jay

WICHITA, Kans.  
Price Auto Service Co.  
301 S. Topeka Ave.



# AUTO SUPPLY CO.

## It's Paying Thousands of Dealers to Remind Motorists Like This



## The Walker Merchandiser Sells Jacks!

You are interested in bigger profits. So you must be interested in the live Walker merchandising plan. It opens the way to these bigger profits.

Here are the facts:

5 out of 6 motorists need new, dependable jacks.  
2 out of 3 have no jacks at all.

The Walker Merchandiser reminds the motorist every time he comes to your store to get a jack. It puts you in line to make the extra sale of a dependable Walker jack. It tells the motorist to buy his jack NOW!

Over 8,000 dealers have multiplied their jack sales and jack profits with the Walker Merchandiser. Increases of 300% to 600% are common.

You can have this big increase in jack business. The Walker Merchandiser will do it for you.

### Merchandiser Free

The Walker Merchandiser costs \$7.50 to make. It costs the dealer absolutely nothing. We supply it with a standard assortment of Walker Jacks. There are 15 jacks in the assortment, seven different types. A Walker Jack for every purpose.

Ask your jobber's salesman for prices and discounts and get this big money-maker working for you now.

**WALKER MANUFACTURING CO.**  
Racine, Wisconsin



# Walker JACKS

*"Dependable in Emergencies"*

## It's New!

Two steel rails, one on each side of the felloe, clamped to each spoke, the cross-chains fastened to them by easily operated snap-fasteners. Each cross chain has plenty of room to move so the tire is not worn. Cross-chains can be renewed at trifling cost.

The car need not be jacked up to apply Travelon. It need not be rolled. Easy attachment is sure under any and all conditions.

Dealers need a non-skid device with so many excellent selling features. The list price is not much greater than that of customary chains: the striking advantages make the slightly higher price easy to get—and the profit very much worth having.

Ask for details and discounts.

THE **SHAW-WALTON CO.**  
PONTIAC, ILLINOIS

# Travelon

## NON-SKID ATTACHMENT



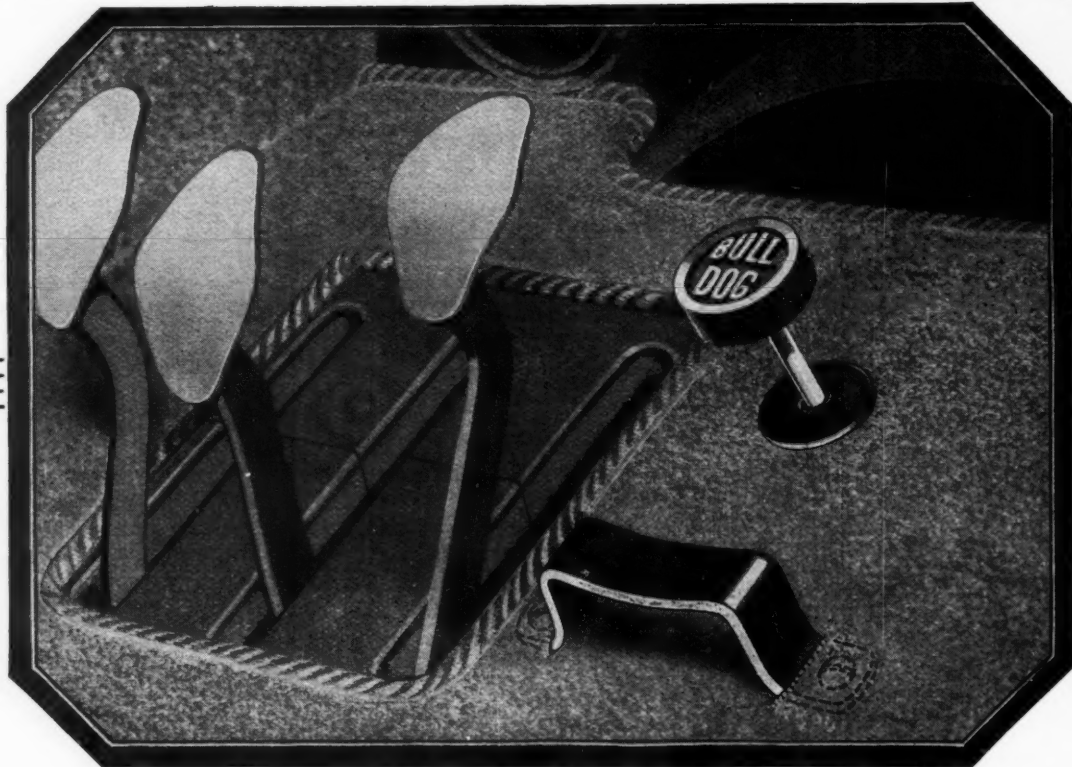


# "Bull Dog"

## FOOT ACCELERATOR *for* FORDS



"Something  
for the  
Car for  
Christmas."



"Something  
for the  
Car for  
Christmas."

### 8 Reasons Why They Sell Easier and Faster

- 1**—Simpler of installation and operation.
- 2**—Best in construction and assembly.
- 3**—One size and style fits all Fords, all carburetors.
- 4**—Neat, rubber-covered foot Pedal.
- 5**—Non-slip foot rest.
- 6**—Floor mat Binder.
- 7**—Price only \$1.50.
- 8**—Effective Sales Helps.

### Helps the Car Hold the Road

—and that's especially important when pavements are slippery, roads muddy, rutty or snow covered. The instant control of power given by the Bull Dog Foot Accelerator, enables the Ford driver to make speed safely, easing over the treacherous places with both hands on the wheel. Do they sell? Sales for first three months of 1923, four times first three months of 1922.

*Ask your dealer—Dealer ask jobber,  
or Write Us.*

*Manufactured by*

**The W. H. Thomas Mfg. Co.**

404 West 6th Street, Spencer, Iowa

*Sales Representatives*

**The Fulton Company, Milwaukee, Wis.**

# Get This!

## The Price is Reduced but the Quality is the Same

Increased sales make possible a production schedule with much lower costs. This saving goes to TEMCO users in a decided reduction of prices, as shown below, and as announced last month.

But TEMCO Quality remains the same! That is one place where we will not make a cut. The performance of TEMCO Tools means too much to our customers. For example, read this letter, then you can better realize what it means to be able to get that same TEMCO Quality at the new reduced prices.

### Read This Letter

"Your Model 'K' 1/2 inch TEMCO Drill is giving splendid service. It is in use every day in our truck service station doing all kinds of drilling operations and running a reboring tool. This latter operation necessitates the drill running under very heavy duty for three hours at a time and this Drill has given most satisfactory service."

Richardson Motor Sales Co.,  
Memphis, Tenn.

Look at these New Prices for

### TEMCO

#### Heavy Duty Drills

Model "D"— 1/4 inch.....	\$28.00
Model "H"—5/16 inch.....	50.00
Model "J"— 3/8 inch.....	62.00
Model "K"— 1/2 inch.....	80.00
Model "N"— 5/8 inch.....	88.00
Bench and Post Drilling Stand.....	26.00
We also make Bench, Pedestal and Tool Post Grinders.	

#### Ask Your Jobber

for complete information regarding TEMCO Tools, or write us, giving your Jobber's name.



### TEMCO

Model "K," 1/2 inch  
Heavy Duty Drill

New \$80<sup>00</sup>  
Price



This  
Screw Feed  
Attachment

is furnished as regular equipment with TEMCO Models "K" and "N" Heavy Duty Drills.

# TEMCO

## Portable Electric Tools

*The Highest Grade for the Automotive Trade*

The Temco Electric Motor Co. 712 Sugar St. Leipsic, Ohio







## MORAL -

After all, the items that make you steady sales, year in and year out, are the bread-winners of the business.

For nine years the sale of Rose Tire Pumps has been second to none. Today more Rose Pumps are sold than all other makes combined.

That's a tune you can play on your cash register any day and produce music sweet to the ear of every dealer.

FRANK ROSE MFG. CO.  
HASTINGS, NEBR.

# ROSE

Easy  
Valve  
action

# Tire Pump



## Winter

The changing seasons mean nothing to the strength of Hays Hickory Hitters. The coldest winter day—when finest steel becomes brittle as glass—or the hottest day of summer—when steel softens and even the paint on it blisters—neither affects in any way the nature-grown, fibrous resiliency of those straight grained hickory bars. Nor is there any chance for error as nature does the tempering and each of the millions of individual fibers is always ready to offer its individual resistance to every shock.

Not only superlative strength but extreme lightness in weight is achieved by use of these hickory bars. The Hays Hickory Hitter weighs only from one-third to one-half as much as serviceable steel or iron bumpers, thus lessening greatly the wear on car and tires.

Improved, Patented Fittings have been designed for both front and rear bumpers. They are simple, rigid and strong and attach the Hays Hickory Hitter to any car with an unrelenting grip that can not be shaken, or torn loose. Yet no

drilling is necessary. Their strength is excessive, still they too, are extremely light in weight.

These new fittings, together with springs of the finest crucible steel and massive cast brass bar clips are worthy companions of the fine hickory bumper bars. The whole is a bumper for which a "for the life of your car" guarantee is most reasonable. And the J. M. Hays Wood Products Co., a concern of 45 years' experience and leadership in manufacture of wood and metal products, guarantee the Hays Hickory Hitter against breakage from any cause whatsoever, for the life of the car to which it is attached.

**Dealers:** There is no bumper which you can handle with so much satisfaction and profit as the Hays Hickory Hitter. It makes friends for itself and for dealers wherever it goes. One Hays Hickory Hitter on the street means fifty more sales. Write for catalogue and the name of our jobber in your territory, also for our contract plan of sales to dealers.

**Jobbers:** Desirable territory is still open. Write for details.

# HAYS HICKORY HITTER

## Guaranteed for life of your car

Double Bar Type  
**\$18.00**

Weights 27 pounds

"Junior" Double Bar Type  
**\$15.50**

Weights 20 pounds

Single Bar Type  
**\$12.50**

Weights 18 pounds

The "Junior" is a double bar type Hays Hickory Hitter made especially for Fords, Chevrolets, Star Cars, etc.

**J. M. Hays Wood Products Company**

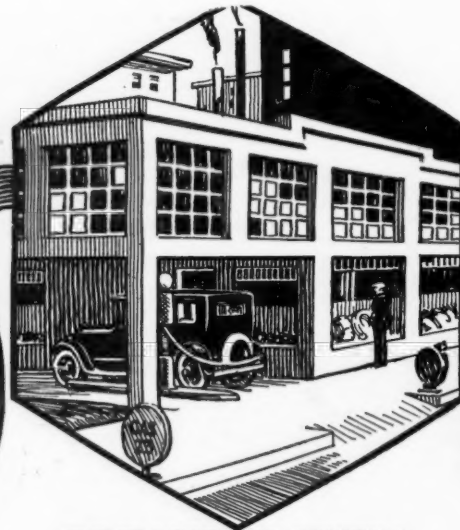
A Division of the Standard Crate & Filler Co.

JEFFERSON CITY, MO.

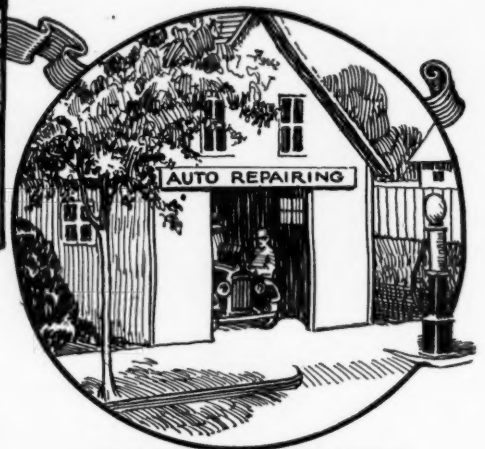




MAKING PROFITS



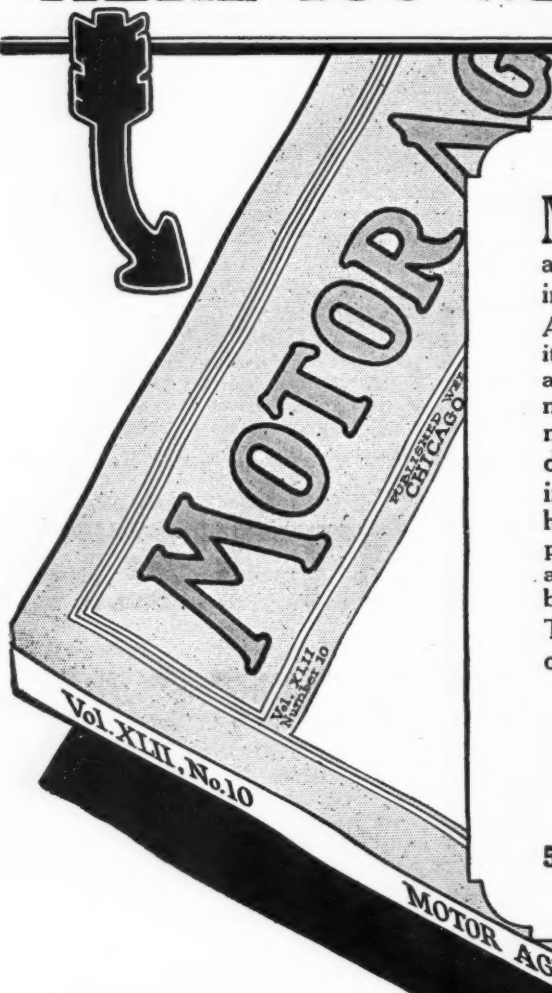
BREAKING EVEN



LOSING MONEY

# WHY?

HERE YOU WILL FIND THE REASONS



**M**OTOR AGE has set for itself a definite mission. It is a business paper of the automotive trade and concerns itself with the greater success of those in this tremendous field.

Among other important features, MOTOR AGE brings to its readers the fundamental reasons for success in the automotive trade. It tells why certain types of automotive merchants are successful and why others are not. It gets down to facts and specific reasons. It doesn't preach—it advises. As an influential factor in the progress of the automotive trade, MOTOR AGE has as one of its policies the belief that all of us can profit by the experiences of others. In every issue are found many valuable thoughts that were aroused by some dealer's experience.

Thousands of leading automotive dealers the world over are thus profiting by these weekly messages.

## MOTOR AGE

5 SO. WABASH AVE.,

CHICAGO, ILL.



# You can now have this business— at a profit

Like most other dealers you probably have been side-stepping windshield glass replacements. Glass has been hard to get. Your profits were often eaten up in breakage and the time consumed in getting the glass and having it cut.

PORTER Redi-Cut Glass solves your problem and permits you to get this business at not only a profit but an unusually **good** profit. PORTER Redi-Cut Glass is cut to exact pattern for Ford windshields and windows with necessary edges finished. It is genuine hand blown triple strength crystal sheet glass, especially adapted to this service.

Jobbers receive PORTER Redi-Cut Glass ready for re-shipment to dealers. Dealers can place the containers in stock without unpacking. Danger of breakage is reduced to minimum.

When a customer needs new glass you can supply him promptly from your own stock at **about half the price he is accustomed to pay**. Yet your percentage of profit is better than on most lines of merchandise.

Ask your jobber—he'll quote you prices on PORTER Redi-Cut Glass that will pleasantly surprise you. If he has not yet stocked it, write us direct.

## This Package Designed to Minimize Danger of Breakage

This method of packing was developed to meet the largest objection to glass replacements on the part of jobbers and dealers: breakage. It permits this business to be handled with no greater loss from damage than is found in many other lines of merchandise.



**PORTER MIRROR & GLASS CO.**  
Fort Smith, Arkansas

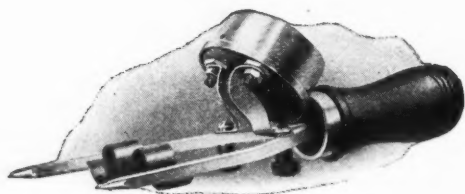
Automotive Division  
3106 Locust St., St. Louis, Mo.



# PORTER REDI-CUT GLASS



# Heavy Discharge Battery Tester



**T**HIS handy prod, with voltmeter attached, tells you the actual condition of any battery almost instantly. Tests while battery is under heavy discharge, giving individual cell voltages—the only true battery test. No need to remove battery from car or even stop engine. Customers can see exact condition.

Range 3-0-3 volts. Easily read scale. Properly spaced prongs for pressing into cell terminals. Wooden handles.

## Write for Booklet H

It illustrates, describes and gives prices of all Weston instruments and accessories for automotive service. If only to be properly informed, you need this booklet.

**Weston Electrical Instrument Co.**

10 Weston Avenue

Newark, New Jersey

# WESTON

Electrical Indicating Instrument Authorities Since 1888

STANDARD—The World Over



## You can't beat a leather fan belt

**Y**OU can't compete with nature in the making of belts. Nothing has ever been made, or ever will be made to give the service—the long wear, the grip and pull—of honest leather.

And drivers are realizing this now as they never have before. They want *leather fan belts*—Graton & Knight fan belts.

The display case above is to help you tell the world that you have what it wants. In orderly array, well displayed, is fan belting that you can talk about and that will back up in service what you say about them.

The famous Graton & Knight Link "V" belt in the display case is one of the fastest sellers, and one of the most profitable ones, you ever handled. Of wonderful strength, easy to make endless, noiseless in operation, almost indestructible—the Link "V" has friends everywhere.

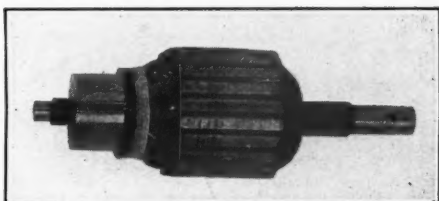
Ask your jobber about the Graton & Knight display case. Get yours now.

**GRATON & KNIGHT**  
WORCESTER, MASS.



*Nothing takes the place of Leather*

## Pocket the Difference!



### PRICE LIST Net Prices

Ford Generator Armatures.....	\$ 1.95
Ford Starter Armatures.....	2.00
Any Make of Two Unit Generator Armatures.....	4.95
Any Make of Two Unit Starter Armature Rewound .....	6.75

#### Motor Generator

Northeast .....	11.00
Simms Huff .....	7.00
Delco .....	12.00
Dyneto .....	12.00
Detroit .....	12.00
Any Vacuum Cleaner Armature.....	3.50

Every repairman knows that there are two kinds of repair jobs; those that pay and those that don't. Those that don't are usually the small jobs that require an amount of time out of all proportion to their value. They are the jobs that you lose a customer's good will on if you charge for your time and jobs that you lose money on if you don't.

Armature rewinding is in this class. Few repair shops have enough rewind jobs to warrant installation of the special tools and machinery necessary to turn out a rewind job in profitable time.

But it isn't necessary to lose the job, the customer's good-will or the profit. Just take armature out, take bearings and end plates off and ship armature to us. We are armature winding specialists and keep a large stock of rewound armatures on hand which enables us in practically all cases to exchange and ship a rewound armature to you same day old one is received.

You replace bearings and end plates, put armature back, and — Pocket the Difference between your bill to your customer and our bill to you. Due to quantity production these prices to you (as shown in the price list opposite) are so low that the pocketed difference will represent a very fair profit *and so much velvet!*

## We Guarantee Every Armature We Rewind

Which means satisfaction to you and your customer.

**Try Us On Your Next Rewind Job**

Our new plant just completed has a capacity of 1500 rewind jobs a day.

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**H.M.FREDERICKS CO.**  
*Armature Winding Specialists*  
 Lock Haven Penna.

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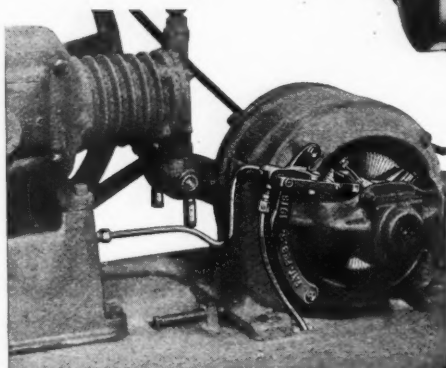
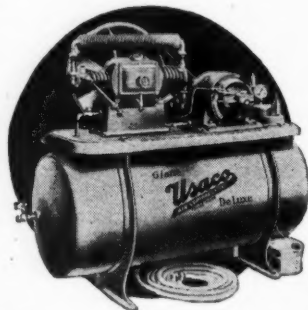
### A Four Fold Advantage

The Usaco Unloader on A. C. Equipments in conjunction with the Auxiliary Starting Tank—

Takes the starting load off the motor, Discharges the oil and moisture extracted by the Filtering Trap.

Protects the motor against low voltage overload and materially aids in cooling the air.

**Usaco**  
AIR COMPRESSORS  
TRADE MARK



## The Line of Many Refinements

THE unprecedented success of Usaco Air Compressors is attributable to a number of valuable refinements, noteworthy among which is the Usaco Automatic Unloader.

This unloader affords many advantages, one of which is very exceptional.

Adequate lubrication of accurately fitted pistons requires a liberal amount of oil, some of which undoubtedly gets into the air during compression.

Air also carries moisture which condenses while cooling, after compression.

On most compressors this unavoidable accumulation of oil and water is carried directly into the tank and later into tires. But, in the Usaco it is caught in a filtering trap and discharged by the Usaco Unloader.

This Unloader is amply covered by patents and, therefore, the advantages it affords can be obtained only in Usaco Compressors.

**THE UNITED STATES  
AIR COMPRESSOR CO.**

5304 Harvard Ave., Cleveland, O.



## Holmes No. 110 Automobile Wrecker

**SPEED** AFTER you get there is even more important than speed in getting there. The road must not be blocked. The owner wants to see his property in safe hands. If you spend too much time your profit dwindles.

The one-hitch straight pull of the swivel head cuts the time to the minimum. And as you don't have to back across the road, traffic moves right along. Back to the shop you go, in jig time, with another good job securely held in your Holmes V tow-bars.

Ask Your Jobber

**ERNEST HOLMES CO.**

CHATTANOOGA,

TENN.

Can be equipped with electric drive in ten minutes at moderate cost.

Adjusts to four positions without weakness.

Permanent handle on second gear quickly adjusts length of cable.

Whole controlled while standing on ground in one spot.

No climbing in or out. Profits running from \$100 to \$500 easily made.

Winch without block in cable multiplies power 21 times. Gives 40 to 1 increase with block.

Full floating drive shaft in bronze bushings. Crank fits both ends.

Strain of cable falls on extra heavy tube-axle, relieving drive shaft of bending stresses.

Long sills distribute stress all over frame of car.

# Do that turning job YOURSELF!

Every time you send a job out to a machine shop it reduces your profits proportionately. A lathe in your own shop would make it possible for you to handle many repair jobs which otherwise go elsewhere.

Giving better repair service is made easy with

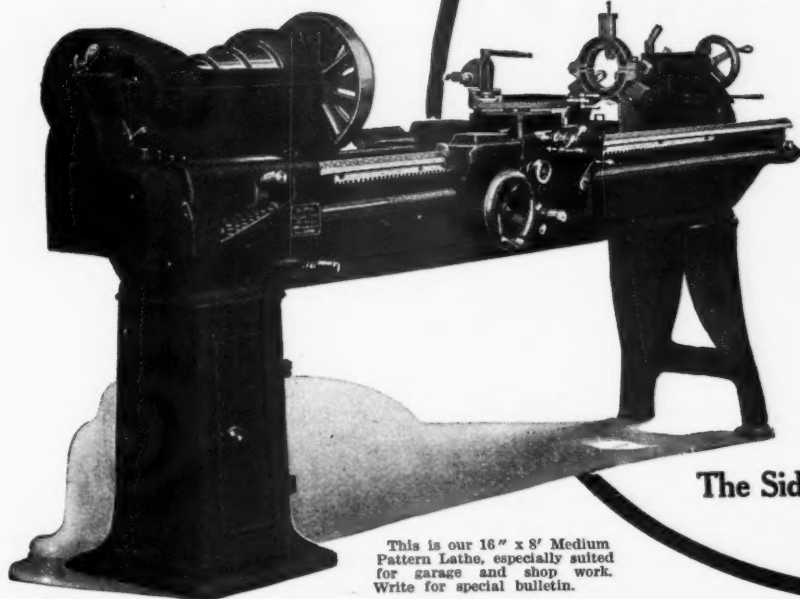
## SIDNEY Medium Pattern Lathes

They provide a dependable means for handling a large range of work at very small cost. Sturdy construction enables them to stand the knocks and handle heavy jobs with precision and speed. Built in a variety of sizes from 14 to 24 inch swing and 6 to 10 foot lengths. Standard equipment includes many attachments and special features found only on larger and more expensive machines.

Write today for prices and complete descriptive literature on Sidney Lathes.

The Sidney Machine Tool Co.

Dept. 1512  
Sidney, Ohio



This is our 16" x 8' Medium Pattern Lathe, especially suited for garage and shop work. Write for special bulletin.

"Something for the Car  
for Christmas"

## "Helzens" Mean Merry Christmas

### HELZEN PEDAL SLOT CLOSERS

Separate Closers allow for perfect alignment with each pedal.

Bolted to lower board only

Special Rubber hugs the pedal and closes slot completely.

Rubber runs full length of Closer

HELZEN CORP.  
MILWAUKEE

These easily-attached, neat-looking Helzen Pedal Slot Closers keep out the cold drafts of air that come up through the pedal slots of a Ford in cold weather.

### An Ideal Christmas Gift

Wrapped in holly paper if requested. Makes an attractive Christmas package. The rubbers fit snugly about the pedals, run full length of the slots and close them completely. Yet there is no interference with the operation of the pedals or the removal of floor board.

Price Per Set \$2.25

For all Fords. Type A is for Coupe, Roadster, Touring Car or Truck. Type B is for Sedan and 1924 Coupe. When ordering specify type wanted.

**DEALERS:** Stock this live item, for which the demand is already created, and for which there's a special need right now. Price a feature. Jobber will supply them wrapped in holly paper if requested.

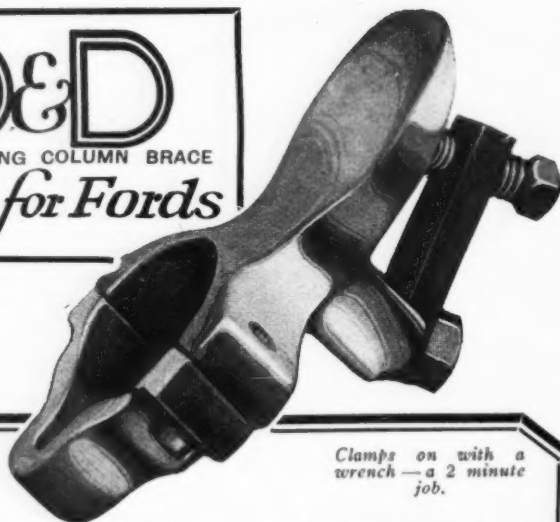
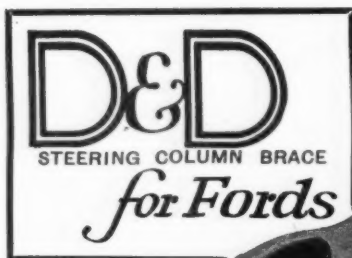
Exclusive Sales Representatives

THE FULTON COMPANY

Dept. 15-H  
Milwaukee, Wis.

Ask your Dealer—Dealer  
Write Jobber or us





Clamps on with a wrench—a 2 minute job.

## Makes the old Fords Drive like new Fords

The new Fords are equipped with a brace to hold the steering post rigid and prevent wheel shakes and wobbles. Fords not originally equipped can be handled as easily as big cars when equipped with the D & D Brace.

More than 225,000 already sold. Retail at \$1.50 with good profit. Nickel plated over an aluminum-steel casting. Rust-proof.

Get a supply from your Jobber.

The L. H. Daley & Co., Columbus, Ohio



## Special Garage Lathes

All engine lathes are not suitable for garage and repair-shop work. Some are too complicated and high priced—others can't stand up to the kind of work a busy repair-shop has to do.

Select a Carroll-Jamieson Garage Lathe, and you get the result of 20 years of lathe building. We know what you want in a lathe and we have designed accordingly.

C. J. Lathes are the greatest value possible. 13, 15 and 16 inch swing. 5 to 12 foot lengths.

Before buying anywhere, send postal for our Bulletins and Special Price Discounts.

Carroll-Jamieson Machine Tool Co.,  
BATAVIA, OHIO

CARROLL



JAMIESON

GARAGE

LATHES



SHOW any man the automatic locking feature of the STA-SET Wrench and your sale is closed. You will find him quick to appreciate its principle, quick to appraise its value as an exceptionally good tool. The STA-SET is destined to become the world's greatest adjustable wrench.

Obviously, quick turnover insures increasingly satisfactory profits.

Write for illustrated folder and price list. Give jobber's name.

HJORTH TOOL CORPORATION  
JAMESTOWN, N. Y.

## Selling trucks and buses is easier when you know the owner's viewpoint

Read *Motor Transport*.

It tells you the problems of the Fleet Owner. It tells you how Fleet Owners are making and can make a success of truck or bus operation.

Just as *Motor Age* tells you how to handle your business, so *Motor Transport* tells how to efficiently operate fleets of motor trucks and buses. Reading *Motor Transport* will make you a better dealer.

Recommend fleet owners to whom you have sold trucks or buses to subscribe for *Motor Transport*. This magazine will make them more efficient operators.

You will both benefit!

*Motor Transport* is published semi-monthly, on the 1st and 15th. The subscription price is \$2.00 per year (\$2.50 West of the Mississippi).

Write for a sample copy.

**Motor Transport**  
FORMERLY COMMERCIAL VEHICLE

(Published by the Class Journal Co.)

239 West 39th St. New York, N. Y.

# Announcing the Winners

## of the MARVEL Radiator Cap Prize Contest



Now that the contest has ended we wish to thank those who sent in such excellent and interesting answers.

We have had a lot of fun, we have made a lot of friends, we have kept the judges busy—and now we offer you our service of supplying MARVEL Wing and Bar Caps to the trade.

Write for our new catalog, just off the press.

**MOTOR EQUIPMENT MANUFACTURERS, Inc.**

33 West 60th Street

New York City

**1.** The gold-plated MARVEL Wing Cap with gold-plated Motometer is awarded to Mr. G. H. Grambsch of Golden Rule Service, Milwaukee, Wis.

"The Motometer is reversed"

"The Final touch for the Fine Car"

**2.** The silver-plated MARVEL Wing Cap with silver-plated Motometer is awarded to Mr. J. A. Tanenbaum, of American Auto Supply Co., Inc., Scranton, Pa.

"Motometer is inserted with driver's side toward the front."

"Marvel—The Cap With Snap"

**3.** The nickel-plated MARVEL Wing Cap with nickel-plated Motometer is awarded to Mr. R. E. Dillon, care Payne & Dillon, Lynchburg, Va.

"The dial of Motometer is facing the wrong way"

"It's a Marvel"

The next twelve best answers, each of which wins a Marvel Wing Cap, were submitted by M. Peck, Mgr. of Blairmore Garage, Blairmore, Alberta; M. Hadden of Century Automobile Co., Joplin, Mo.; Corwin S. Rogers, Mgr., The Chevrolet Garage, Spalding, Nebr.; R. S. Cheney of Burdick Tire & Rubber Co., Chicago, Ill.; John J. McCarthy, Jr., of McCarthy Bros., Inc., Philadelphia, Pa.; Harold Everett of Samuel Lytton Everett, Lytton, R. F. D. from Delta, Ohio; Bruce Morris, Care Frank E. Hathaway, Inc., Muskegon, Mich.; Theodore Becker of Gebhardt & Becker Motor Co., McGregor, Iowa; Henri LeRoy, Pres., The Henri-Zone Co., Memphis, Tenn.; S. D. Katz, care Automotive Sales & Service Co., Atlanta, Ga.; G. O. Sullivan, Pres., Jordan Motor Sales, Kenosha, Wis.; N. J. Lee, Care R. J. Burnett Motor Co., Vicksburg, Miss.

### Every "STOP" Light needs this Switch



Price  
**50**  
cents

*—bound  
to sell fast*

Car owners will buy Elm City No. 50 Switches just as fast as they learn about them.

For an Elm City No. 50 will make any "STOP" signal work.

Dealers like to handle it because it is popular and sells fast.

Water, dust and rust proof. Mechanically perfect. Absolutely guaranteed.

Get the details.

**The C. S. Mersick & Co.**

274 State Street, New Haven, Conn.

**Jobbers**

**Dealers**

Every STOP light owner is a prospect. You will be interested in our special trade offer—and discounts.

**DOES SOLDERING IN  
ONE QUARTER  
THE USUAL  
TIME**



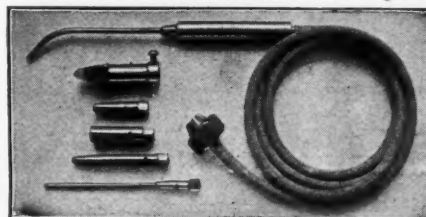
### TORIT TORCH OUTFIT No. 13

Whether the job is lead burning, battery sealing, fender straightening, radiator soldering or loosening a rusty or corroded nut, the Torit, No. 13, torch is always ready at a second's notice to serve you, and the price is wonderfully low. It is handy for soldering tinware, babbiting, joining light tubing, aluminum soldering, soldering electrical connections, etc.

**USES ACETYLENE ONLY**

A splendid use for discarded auto acetylene tanks. Many owners make the Torit, No. 13, pay for itself in a single day. Torch, with 4 different tips, soldering copper, 5 ft. tubing and connection for auto acetylene tank.

**\$7.50**



**ORDER YOUR TORCH TODAY**

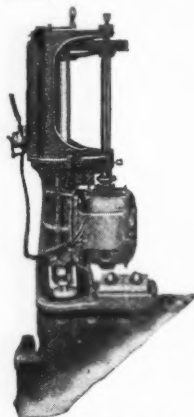
**St. Paul Welding & Mfg. Co.**

169 W. Third St.,

St. Paul, Minn.



New Model "B" with 1/2 H. P. Motor and many other improvements.



Pat. Mar. 16, 1915,  
May 11th, 1920.  
Other patents pending.

## Simplicity

### Portable Cylinder Grinder With Boring Attachment

**Nets This Man \$25 a Day**

Gentlemen:

I have been using one of your Simplicity Regrinders for the past five months and am much pleased with its performance. It is a little gem and a pleasure to operate it, and the work it does is very exact.

The machine will ordinarily net me \$25 per day under local prices and I consider it a good investment.

Very truly yours,  
N. L. JAMES

Tillsonburg, Ontario, Can., Aug. 17, '22.

### A Real Money Maker

Does work equal to big stationary grinders. The only portable reborer and grinder made. Any mechanic can operate it. Saves motorist many dollars—brings you extra business.

Full equipment for handling all cylinders 2 3/4 to 5 1-16 in. diameter and up to 11 1/2 in. long. Guaranteed to do perfect work.

We will exhibit at Chicago and New York Auto Shows

**SIMPLICITY ENGINE & MFG. CO.** Dept. C  
Port Washington, Wis.

District Men Wanted for Open Territory: Attractive proposition for those who can qualify. Write for full particulars.

### Business Starts at Once

We furnish signs, circulars, movie slide, ads for your newspaper—everything to start business your way.

Easy Terms—Free Trial  
Guarantee

Write at once for complete proposition. On our easy payment plan the machine quickly pays for itself. Hundreds being used successfully.

## The Atlas is Winter-proof



**Stronger**

Freezing winter weather holds no terror for the Atlas Radiator. It will make more friends this season and net you profits because it is burst proof. The Atlas core is constructed to expand with freezing water and will not spring any leaks. In summer it will prevent an overheated motor because it has a greater cooling area. Read the other features then write your jobber for details.

Made by The Steidle Mfg. Co.  
CINCINNATI, OHIO

Exclusive Foreign Distributors:

The A. C. Vanderpoel Co., Inc., 11 Moore St.,  
N. Y. City

### ATLAS Radiators for Fords



**Better Cooling**

The Atlas has greater cooling efficiency, too. Its patented tube construction gives it three times the water capacity of the tubular type with four times the cooling surface. It will not burst in winter because its brass honeycomb core is flexible and expands, and because of its greater cooling area, it will not overheat in summer. Beautifully finished—fits the present Ford shell.

Dealers who are installing new radiators on Ford cars can save their customers money by using the old shell.

**"The Radiator  
with a  
Backbone"**

## LOMAR SHOCK ABSORBERS

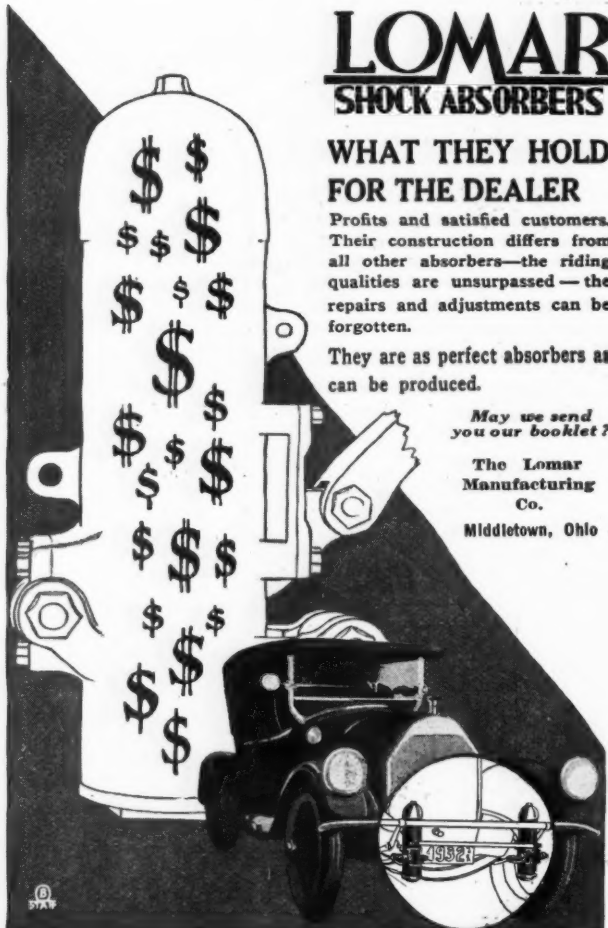
### WHAT THEY HOLD FOR THE DEALER

Profits and satisfied customers. Their construction differs from all other absorbers—the riding qualities are unsurpassed—the repairs and adjustments can be forgotten.

They are as perfect absorbers as can be produced.

May we send you our booklet?

The Lomar  
Manufacturing  
Co.  
Middletown, Ohio



**DELUXE  
Products**  
for the Motorist's Comfort



The guaranteed pump  
with a mile-long  
pedigree

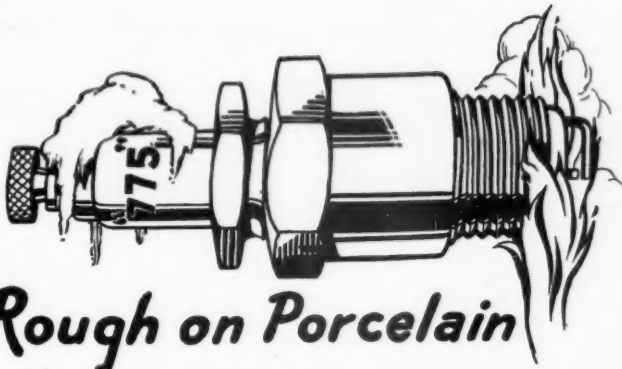
Only \$3.50 Retail

ORDER DIRECT  
SPECIFYING  
JOBBER

The  
**DeLuxe**  
TIRE PUMP

Also  
ARVIN HEATERS  
DE LUXE,  
DE LUXE VENTILATORS

INDIANAPOLIS PUMP & TUBE CO.  
INDIANAPOLIS



## Rough on Porcelain

Try this on your wife's fine china. Put ice on one side and turn a flame on the other. Raise it from zero to boiling temperature in one minute. That's about what a spark plug insulation has to stand, and if it cracks the plug is done for.

There's special porcelain specially fired to withstand these temperature changes. Manufacturers can tell it at a glance, because every insulator made of it carries the figures "775."

Is there a "775" on each of your plugs? You needn't pay any more for plugs that have it. Take a look at them, and remember the number when you buy new plugs.

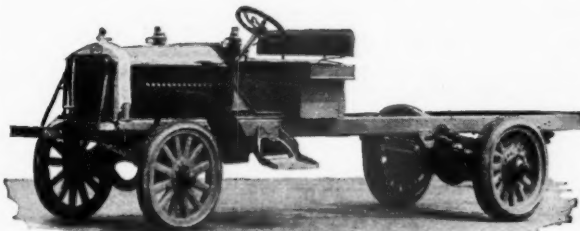
**Frenchtown Porcelain Company**  
Trenton, New Jersey



# STANDS THE TEST

"Established in 1910—  
Busy Ever Since"

## MASTER TRUCKS Balanced Oversize



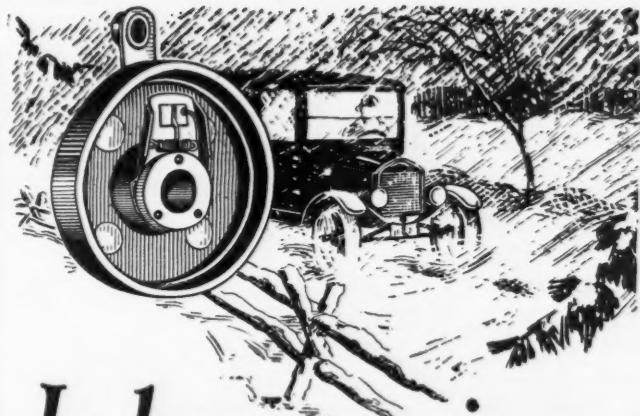
**SPEED MASTER— $\frac{3}{4}$ — $1\frac{1}{4}$  ton**  
Highest Achievement for fast freight transportation

**HEAVY DUTY MODELS— $1\frac{1}{2}$  to 6 ton**  
A revelation to Motor Truck Buyers

Highest grade recognized standard units used throughout. Built by a responsible Company of unquestioned financial stability.

Valuable Territory Open to Responsible Dealers

**MASTER MOTORS CORPORATION**  
2381-2399 Archer Ave. Chicago, U. S. A.



## In heavy going ~

a Ford is no better than its timer. Bell reveals untold power in sand and mud, on hills and in the traffic. Clean, smooth pickup; a snappy getaway; easy starting—all are bywords to the owner of the Bell-equipped car.

### The BELL Timer

makes the best Ford motor better. Precision made. Needs no oiling or attention. Cannot short-circuit. Is oil, dirt, and waterproof.



Solid Bakelite shell      Copper brush  
Copper contacts, molded in  
Clean wipe contact

Sold by leading jobbers everywhere.

**Bell Manufacturing Co.**  
13 Elkins St., Boston 27, Mass.

## A Gasket Paper That Saves You Money



### Every Shop Can Use Adpasco

Adpasco Treated Gasket Paper is needed in every shop for every use except in contact with extreme heat. Don't use expensive packings where Adpasco can be employed in an efficient manner. Adpasco will save you money.

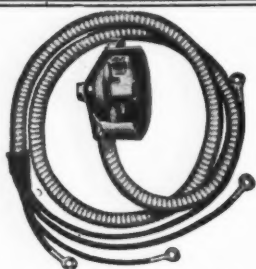
Is Treated—will not rot out and crack like ordinary paper makeshifts. Soft, pliable, holds its shape.

Size 36x40 in. Sold by over 400 jobbers. Used daily in thousands of shops.

### Advance Packing & Supply Co.

66 E. Lake Street Chicago, Ill.  
Pac. Coast Distributor: Allied Industries, Inc., San Francisco, Los Angeles, Seattle





# TURNER

## 2 in 1

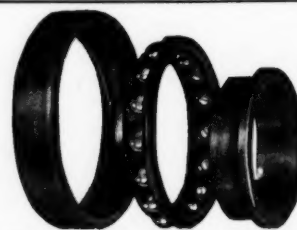
### TIMER

FOR FORD MOTORS

Pat. 2-15-16. 9-18-23 The ever increasing demand for the Turner 2 in 1 Timer for all Ford motors is proof enough of its merit. Ford owners and dealers everywhere are coming to recognize it as the first product in the timer field.

It has stood repeated and rigid tests for over six years. Increases power, insures an instant start in all weather, lessens fouling of two front plugs, saves gasoline and stops motor "kicking." Is oil, grease and waterproof. Requires no oiling and is easily installed. Price complete, \$3.60. Ask us about the Turner Junior Timer and the complete Turner Line of automotive devices.

**TURNER MANUFACTURING CO.** DEPT. K. KOKOMO, IND.



The Bearings Company of America—Manufacturers of Angular Contact Radial Bearings, Angular Contact Thrust Bearings, Thrust Ball Bearings.

Bearings made to your B/P's and requirements. Your present Bearing sizes duplicated.

**The Bearings Company of America**  
Lancaster, Penna.

Detroit, Mich., Office,  
1012 Ford Bldg.



## Is Your Battery Business Paying?

If it isn't, it will be worth your while to investigate the Dragon franchise, because Dragon dealers, without exception, are making money and building a permanent business.

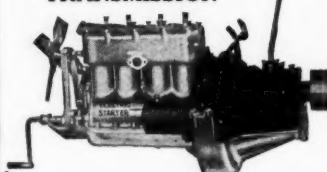
Write or wire

**Englert Manufacturing Co.**  
Pittsburgh, Pa.

# Dragon Storage Battery

## 3 SPEED

SLIDING GEAR  
TRANSMISSION



## for More Power — More Speed

This transmission has three speeds forward and one reverse and replaces the regular Ford transmission, drums, bands and all. The low gear is lower than the Ford, therefore more power, third or high is the same as the Ford high and second is halfway between.

for Ford Cars and Trucks

### CRONK SIMPLEX Sliding Gear Transmission

This transmission is ruggedly built with oversize alloy steel gears. Multiple disc clutch. Foot brake on jack shaft outside of case. Hyatt Roller and Genelite bearings. Installation easy. No cutting or machining.

Write today for other interesting details.

**E. D. & A. F. Cronk, Inc.**

140 Hotel St.,  
UTICA, N. Y.



## Re-Babbitted Bearing Exchange

Our Re-babbitted Bearing Department is over two years old. Over 200,000 Con. Rods have been shipped. Less than one to each 2,000 have been returned as faulty. We have over 5,000 SATISFIED DEALERS in 16 States. We Re-babbitt ANY Bearing that has ever been Babbitted. Special undersize for Re-ground crankshafts 10 per cent extra.

A few of our LOW RETAIL PRICES are:—Marmon and Studebaker \$4.00. Chalmers and Moline Tractor \$3.50. Buick and Maxwell \$3.00. Oakland and Olds \$2.50. Fordson and Dodge \$2.00. Fords 60c each. Liberal Discounts to Dealers and Garages. We pay Transportation one way. RUSH Orders shipped same day order received. Satisfaction guaranteed.

**Fremont Foundry & Bearing Works**  
1340 W. 5th St., Oklahoma City, U. S. A.

## ARE YOU LOOKING FOR A REAL BARGAIN?

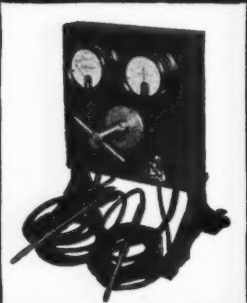
Watch the classified advertising columns of MOTOR AGE and you'll see many of them. Often a man has goods for quick disposal and he announces the fact here. Whether or not you are in the market right now for certain things you will find it pays to look over the classified ads every time you receive your copy of the paper. It's a good habit to get into and some day you'll be mighty glad of it.

Get the Habit—

**READ THE CLASSIFIED ADS  
IN MOTOR AGE**

## ACE HIGH-RATE BATTERY TESTER

shows voltage drop  
and ampere draw



### Inspires Confidence

Shows your customer in a positive way when his battery needs repairs or should be replaced with a new one. In addition to profit it adds to the appearance of your shop and inspires confidence in your ability.

**Price \$39.50**

F. O. B. CHICAGO

Voltmeter and ammeter, precision type, 4 inch diameter, sapphire jewelled. Variable carbon rheostat —0 to 600 amps.

**ORDER FROM YOUR JOBBER**

**WEIDENHOFF** 4350 ROOSEVELT ROAD  
CHICAGO, ILL., U. S. A.

## Get This "Pioneer" Garage Special



Electric Drill  
and Valve Grinder

Greatest time and money saver, as well as money maker, for your shop—

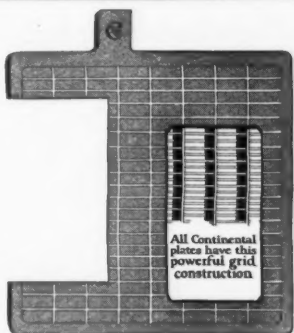
"It Will Do The Work"

**Louisville Electric Mfg. Co.**

Incorporated Louisville, Ky., U. S. A.

C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.

**30%**  
**Longer Life**  
**25%**  
**More Capacity**



## CONTINENTAL DEHYDRO PLATES

The plates are the battery. Their capacity governs the amount of work their life decides whether the buyer gets his money's worth. The entirely new process we use makes Dehydro Plates more porous and bone-dry, so they absorb more electrolyte and give off more energy.

### INTRODUCTORY OFFER

Send for eighteen negatives and fifteen positives, put them through the hardest tests. We feel sure you will get results equal to or better than our claim of 30% longer life and 25% more capacity. The price is only \$5.00 F. O. B. St. Louis, cash with order. Send for these trial plates now, and be convinced of the extra money Dehydro Plates can make you.

*"A Battery Can Be No Better Than Its Plates"*

**CONTINENTAL BATTERY CO.**  
3201-19 Papin St., St. Louis, Mo.

ACCURATELY  
DALL  
MACHINED

**SEMI-STEEL  
REPLACEMENT PISTONS**

ACCURATELY  
DALL  
MACHINED



For replacement work after a rebores or re-grind job insures your customer as good if not a better job than the original assembly.

Dall Pistons are simply GOOD Pistons, made to manufacturer's specifications, sometimes more refined in design and lighter in weight, but always as carefully made and inspected as though they had to pass the most rigid inspection of a Motor Manufacturer.

Dall Pistons are regularly furnished in standard and various oversizes, also semi-finished 1/16 oversize.

Write today for price list and delivery schedule on all items. Distributors at various points will take care of your requirements.

### THE DALL MOTOR PARTS COMPANY

Post Office Station D, Cleveland, Ohio

Southwestern Branch

THE CARROLL CO.

2218 S. Harwood St., Dallas, Texas

## PARANITE CABLE

**Best for Automotive Work**

We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought **PARANITE** Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.

### FOR 33 YEARS THE STANDARD

"IF IT'S **PARANITE** IT'S RIGHT"  
Quality jobbers handle quality cable—  
that's **PARANITE**.

**Indiana Rubber & Insulated Wire Co.**  
Factory and General Offices—Jonesboro, Ind.



## JOHNSON No. 101 Bench Furnace

A necessity in every shop

For heating soldering  
coppers, metal melting,  
heat-treating, temper-  
ing parts, tools, etc.

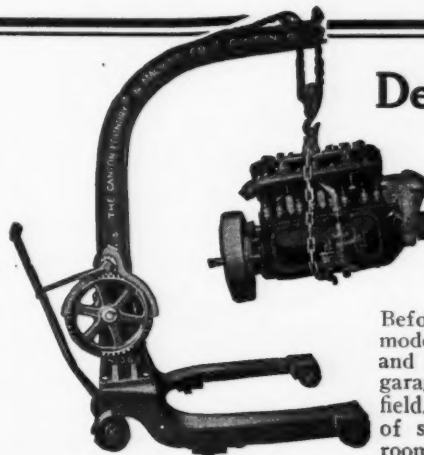
Will produce a tem-  
perature of 2000 degree  
F. in the fire-box.

Write today for complete booklet.

**Requires no forced Air Draft**

**JOHNSON GAS APPLIANCE CO.**  
Cedar Rapids IOWA

Pacific Coast Representative: C. B. Babcock Co., San Francisco, Cal.



**Designed for  
Shops  
Like  
Yours**

Before we built this garage model we studied conditions and requirements in the garage and repair shop field. We studied all kinds of shops—large and small, roomy and crowded, modern and old fashioned. We then designed a special model Canton Crane & Hoist to meet the individual requirements of every shop and garage. We found that the average portable crane was lacking in some respects for efficient garage use and many exclusive features were consequently designed into this model.

As a saver of time and money this piece of equipment will prove one of the most valuable in your shop.

Write for catalog and complete information.

**Canton Foundry & Machine Company**

Canton, Ohio

New York Office

203 E. 15th St.

# CANTON

**PORTABLE**

# CRANE & HOIST



## INTERNATIONAL MOTOR TRUCKS

*for low-cost hauling*

Models range from the 2,000-lb. Speed Truck to the 10,000-lb. truck. Some territory is still open for dealers.

International Harvester Company of America  
(Incorporated)  
Chicago, U. S. A.

**"The Best-Equipped Shop  
Gets the Business"**



Let us send you our FREE Catalogue on

## Huetter's

Fly-Wheel Gear Bands

Huetter Machine & Tool Co.

546 Kentucky Ave.

Indianapolis, Ind.



**"In Stock -  
Not Over a Day Away"**

Write Milwaukee Die Casting Co., Milwaukee, Wis., for name of distributor nearest you.

**MILWAUKEE BEARINGS**

GRINDING  
MACHINES

BORING  
MACHINES

**LANDIS**

LANDIS TOOL COMPANY

WAYNESBORO, PA.

NEW YORK OFFICE:  
80 Church St.

**LONG-LIFE  
Kokomo  
TIRES AND TUBES**

KOKOMO RUBBER CO., Kokomo, Indiana  
131 South Main St.

Kokomo Long Life tires and tubes make money for dealers who handle them.

Kokomo Twin-Grip Fabrics  
Kokomo Two-Grip Cords  
Kokomo Everlast Red Tubes  
Kokomo Standard Gray Tubes

**ALVORD QUALITY TOOLS**



Taps, Dies, Cutters, Drills, Reamers  
Send for Catalog

ALVORD REAMER & TOOL COMPANY  
Millersburg, Pa.

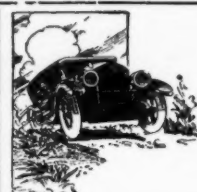


BONNEY FORCE & TOOL WORKS, ALLENTOWN, PA.

**Prevent Scratches and Grease Spots**

**KLEENKAR**  
PROMOTE GOOD WILL  
**SHOP COVERS**

Send for  
Samples  
Automobile  
Fabric  
Equipment  
Company  
703 Cass St.,  
Milwaukee,  
Wis.



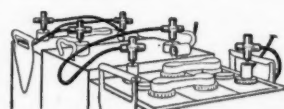
**FOSTER PISTONS**

**MAKE MOTORS POWERFUL**

Our proposition to Dealers is more than interesting. Write today.

FOSTER-JOHNSON REAMER CO.  
1048 Beardsley Ave. Elkhart, Ind.

**SHURO BATTERY CONNECTORS**



A tap with a hammer anchors them into battery terminal—like a nail in a block of wood. Positive metal-to-metal contact. Built to last for years.

BURTON-ROGERS CO.  
26 Brighton Ave., Boston



**Bosch**

Be sure to specify Robert Bosch—the finest automotive electrical equipment in the World.

ROBERT BOSCH MAGNETO CO., Inc.  
The Genuine, Original Bosch  
Otto Heins, Pres., 123 West 64th St., New York

**WEL-EVER OIL  
PISTON RINGS**

Write for interesting circular on oil pumping and details about this fast selling piston ring.

THE WELEVER PISTON RING CO.  
1713-15 Canton St. Toledo, Ohio

Less Oil and Gas—from WEL-EVER equipped units. Its oil control feature is guaranteed to stop oil pumping, prevent spark plug fouling and reduce carbon formation.

**bethlehem betterments**  
*for Motordom*  
**Utilities—Not EXCESSories!**



Six design and style bumpers from which to make selection for all popular make cars

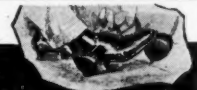
Write for details.

THE BELLEVUE MFG. CO.  
Bellevue, Ohio

A POST CARD WILL BRING YOU FULL  
DETAILS ABOUT THE WONDERFUL

**AIR CONTROL**

M.P.C. Pneumatic Accelerator *for Fords*  
MOTOR PRODUCTS CORP. DETROIT, MICHIGAN



## Profit in Flat Rates

The Hall Cylinder Hone turns out a perfect job, cuts labor cost and keeps your customer's car from being tied up. O. K.'d and recommended by Buick engineers.

The Hall Cylinder Hone Company  
435 Dorr St., Toledo, Ohio



## Flatlite

A reflector—not a lens. Greatest dealer opportunity ever offered. Sold either as complete headlamp or simply as a reflector to be inserted in lamps now in use. Write.

THE AMERICAN FLATLITE CO., Cincinnati, Ohio

## EATON

BUMPERS

Made of the Super-Steel  
Mo lyb den um

FORWARDLY & CON BUMPERS

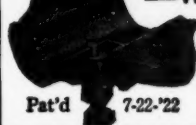
for Beauty—

Strength—Endurance

The EATON AXLE & SPRING COMPANY  
CLEVELAND

## TAKE THE END-PLAY OUT!

—WITHOUT PULLING THE MOTOR



THE C. A. ADJUSTABLE CENTER BEARING CAP corrects Ford crankshaft end play and sets magneto for highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year. List price \$3.75. Ask your jobber or dealer or write us direct.

Pat'd 7-22-'22

ADJUSTABLE BEARING CO., Inc.  
Dept. M. Brazil, Indiana



Should Be On Every Car  
You Sell

The Spencer Lock Tilting Steering Wheel first adds comfort in the driver's seat—then protects the car from theft. And the insurance it saves pays back the purchase price. Ask your jobber for details. Made for Ford, Dodge, Overland, Chevrolet 490 and Superior, Maxwell, Star and Gray Cars.

The Spencer Mfg. Co.  
Spencer Ohio



## QUICKLIFT SERVICE JACK

A "SAFE" one stroke pry jack for all light cars. Instant adjustment—handle won't snap up and damage car. Made of steel—priced low. Write for catalog.

C. A. DICKERSON  
COMPRESSOR CORP.  
220 Chicago St., Buffalo, N. Y.

THERE are two factors that determine the value of a publication as an advertising medium.

Editorial excellence will indicate its influence with its readers. Membership in the Audit Bureau of Circulations indicates its business ethics and methods.

The first shows whether the paper is worth reading.

The second shows how many people read it.

In both the advertiser is vitally interested. MOTOR AGE invites the closest scrutiny. Its A. B. C. report is accessible to advertisers.



Relio, an electric-drive wet grinder for pistons, pins, valves, bushings, \$475.00.

Valvo, an electric-drive bench grinder for valves, valve-seat reamers \$175. See page ads this paper.

Van Norman Machine Tool Co.  
Springfield, Mass.



\$58.50

f.o.b.

Norristown

## Franklin

The  
Air and Water Station  
that makes free air pay

A big Business getter for all garages and service stations. Stands 12 ft. 6 in. over all; glass-encased revolving head wired for an electric light; long air hose that will reach two cars without moving them. No springs to rust or lose tension. Order today or write for full particulars.

FRANKLIN AIR COMPRESSOR WORKS

2604 Main Street, Norristown, Penna.

## Speaking of Batting Averages

Babe Ruth .....393

ANCHOR BULBS .....993



We are out to make it 1,000. Can't be done, you say? Our triple-test has kept one large auto lamp maker from finding a bad Anchor bulb in three years. Laugh that off!

JOBBERS—What's wanted is a lamp that doesn't fail. What's wanted SELLS. The money-maker for you and your dealers is the Anchor: triple-tested, never bested.

## SAME DAY SERVICE

Send a sample order, find out how quickly and accurately we ship; and with it get our prices and generous discounts. Obey that impulse! Write.

Anchor Electric Co.

555 W. Jackson Boul. Chicago, Ill.

## PAROB EXPANSION HAND REAMER

BLADES CUT AT DIFFERENT ANGLES

Each successive blade cuts AT A DIFFERENT ANGLE from the one before it.

No CHATTER, no DIGGING IN—even in keyed holes.

TWICE the expansion of others. All sizes. Money-back guarantee.

Ask about the GAMMONS TAPER PIN REAMER—Wonderful Time-saver.

THE GAMMONS-HOLMAN CO.

Dept. C.

Manchester, Conn.



## Dependability

In the new Waukesha Bus and Truck Motor emphasizes itself not only in performance, but in steady low operating cost, especially.

Write for full details

THE WAUKESHA MOTOR COMPANY  
Waukesha, Wis.

BUS and TRUCK MOTORS



# LINCOLN

FOR ALL CARS—\$15 to \$36

## SHOCK ABSORBERS

# ECLIPSE

Safety Driving

## SHADE

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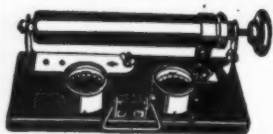
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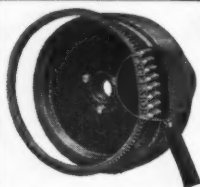
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For every American Car and Truck

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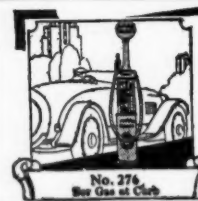
Install quietness — Cloyes NOISELESS Timing Gears. They give the motor a soft, even "purr"—permanently.

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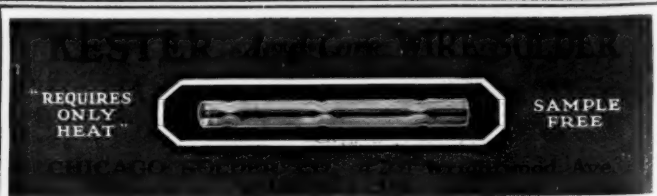
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Screw gauge to dash or instrument board; connect copper tube with elbow in place of lower petcock. No oil passes thru tube or gauge. No moving parts, floats or plungers. Easy to sell; easy to install. Big money-makers.

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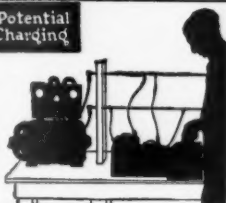
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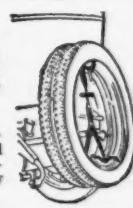


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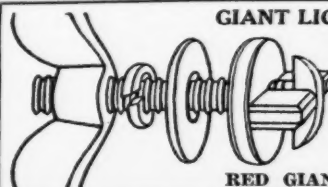


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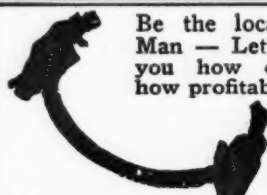
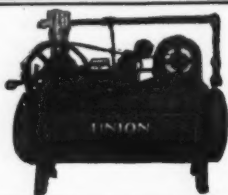




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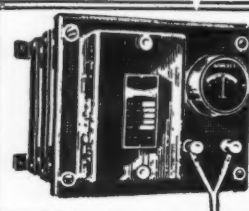
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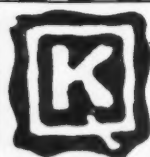


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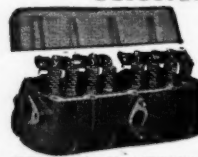


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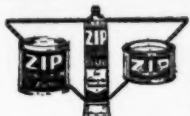
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So powerful that the combined strength of three men could not "stall" it when drilling 1/2" holes in steel. Write for miniature catalog describing the complete line of Petersen Portable Electric Tools.

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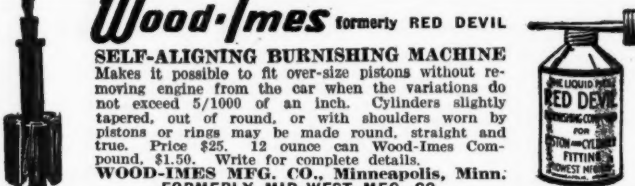
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**UNIVERSAL**  
2 rings that cover every need  
Ground or turned finish  
Attractive jobber's proposition  
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BALTIMORE, MD.



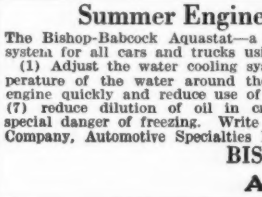
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**SELF-ALIGNING BURNISHING MACHINE**  
Makes it possible to fit over-size pistons without removing engine from the car when the variations do not exceed 5/1000 of an inch. Cylinders slightly tapered, out of round, or with shoulders worn by pistons or rings may be made round, straight and true. Price \$25. 12 ounce can Wood-Imes Compound, \$1.50. Write for complete details.  
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The Bishop-Babcock Aquastat—a simple, positive, automatic control of the cooling system for all cars and trucks using pumps—is guaranteed to produce these results:  
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**BISHOP-BABCOCK AQUASTAT**

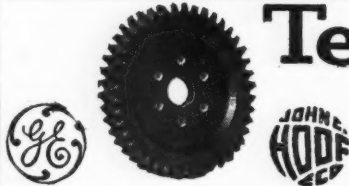


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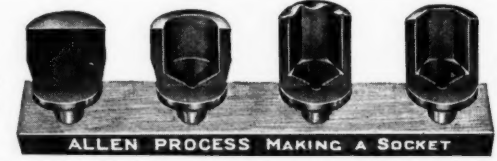
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Sell one with every car  
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FORD ARMATURES REWOUND \$2.00  
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**ALLEN WRENCH SETS**  
ALLEN PROCESS MAKING A SOCKET  
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Everything you need, in one small box, compact, accessible, and a real mechanic's outfit. Sockets will not break. Fully guaranteed. Ask your dealer or write us.  
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OVER 50 WONDERFUL SHORT CUTS  
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ASK FOR IT  
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PROMPTNESS ASSURED BEST RESULTS  
Send drawing or model for examination and report as to patentability  
**WATSON E. COLEMAN, Patent Lawyer**  
644 G Street, N. W., Washington, D. C.

The best 72 car  
**DODGE AGENCY**  
in Missouri, for sale  
**W. E. JAMESON, Agent**  
Fulton, Mo.

### We've Got Everything

In New and Used Auto Parts, Accessories and Supplies, for all makes and models of cars.

Engines; Transmissions; Clutches; Axles; Wheels; Rims; Tires; Radiators; Gears; Axle Shafts; Bearings; Magnetos; Starters; Generators; Coils; Batteries; etc., etc.

Ours is the largest stock of its kind in the world.

### Warshawsky & Co.

World's Largest Replacement Parts House

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### AUTO Save 50 — 94% 2000 Models PARTS

NEW AND USED GEARS, AXLES, BEARINGS, SPRINGS, MAGNETOS, GENERATORS, ETC. JOBBERS IN BANKRUPT AUTO SUPPLIES.

**BRIGHTMAN AUTO EXCHANGE**

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If you have stocks of parts, accessories, or supplies for immediate disposal, the logical place to get in touch with your buyers is this Classified Advertising Section.

**MOTOR AGE**

Classified Advertising Department

Chicago, Illinois

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Save Time and Money

We carry a complete line of Automobile Parts  
Transmissions (all kinds)

Cylinder Blocks Magnetos (all kinds)

Drift Shafts Carburetors

New Gears (all kinds) Starters

Used Gears (all kinds) Rear Ends

400 Motors of all kinds in stock at all times

WRITE

**BENNETT BROS.**

Largest Auto Wreckers in the Country

Grant and Water Sts. Pittsburgh, Pa.

Mail Orders Given Prompt Attention

### BOSCH MAGNETOS

GENUINE GERMAN BOSCH MAGNETOS, enclosed type, with platinum points, at a sacrifice. At the rate these magnetos are selling, we expect to be sold out within 30 days.

OUR PRICE	LIST PRICE
ZH6 \$18.00	\$ 60.00
ZH6 15.00 (M14)	60.00
ZR4 (2 spark) single	\$30.00 100.00
ZU4 (2 spark) dual	35.00 100.00

These are brand new and packed in the original cases. Order at once as they are going fast.

WRITE—WIRE—or PHONE No. 3-5972  
Special price if bought in quantity. How many can you use?

**CONN. AUTO PARTS CO.**  
36 Morgan Street, Hartford, Conn.

### AUTO INDUSTRY MAILING LISTS

Send to headquarters for dependable lists of Automobile Owners, Dealers, Accessories, Garages, Tire and Battery Stations, Truck Fleet Owners, Bus Lines, Taxicab Companies. Write for catalog and prices.

**MOTOR LIST COMPANY**

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### FOR SALE

Three busses, practically new, will accommodate twenty-eight passengers, built on 2½ ton Mack chassis with Sewel wheels, in perfect shape. Will sacrifice for quick sale.

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### PARTS FOR ALL MAKES OF CARS

Immediate service is our motto. Out of town orders shipped the same day they reach us. Full supply of all parts for all cars ever made. Complete line of new and used accessories. Satisfaction guaranteed. Send deposit with order, and specify clearly name, year and model of car. Send part if possible.

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### DOWMETAL PISTONS

Lighter, stronger, and longer wearing than aluminum or iron. Can be fitted with bronze bushings in the wrist pin holes same as in iron pistons. Dowmetal has no permanent growth. The expansion is little more than iron.

SEND FOR PARTICULARS

**LAMMERT & MANN CO.**

Cylinder and Crankshaft Grinding  
215-21 N. Wood St. CHICAGO Phones West 4918

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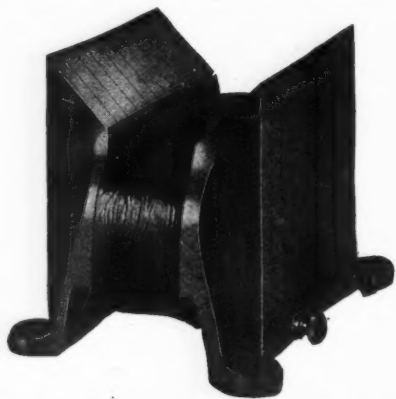
if you are equipped to do cylinder and crankshaft regrinding, this section affords you the opportunity to secure excellent returns.

### MOTOR AGE

Mallers Bldg.

Chicago, Ill.





## This Growler Costs But \$4.50

With it you can tell in ten seconds whether an armature is in good condition. If it is not, you are saved all the grief of having to do the whole job over, losing all your profit and the customers' goodwill besides. Operates on 110 Volt A. C. Current.

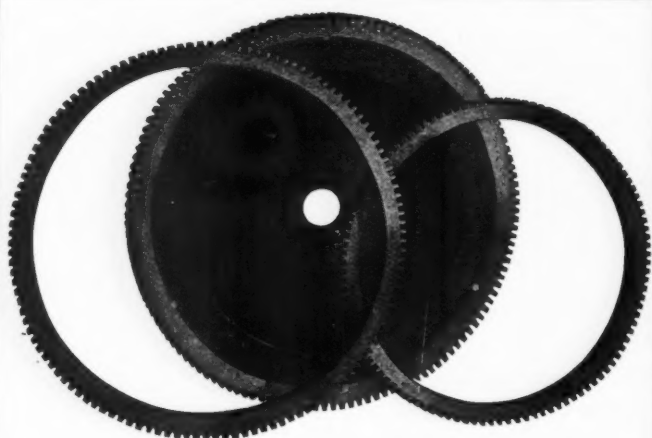
Sold direct or through your jobber. Resale price \$4.50 in Central and Eastern States, \$5.00 in Pacific States. Your check for above amounts plus twenty-five cents postage brings this moneymaker to you.

ARMATURES: We rewind any and all kinds of GENERATOR, MOTOR and MAGNETO armatures, and reship same day old armatures received.

FORD GENERATOR AND MOTOR ARMATURES.....\$ 1.50  
ALL SMALL DOUBLE UNIT GENERATOR AND MOTOR ARMATURES.....5.00  
SINGLE UNIT MOTOR GENERATOR ARMATURES.....10.00  
MAGNETO ARMATURES.....\$3.75 to \$4.75

**Armature Rewinding Co., Inc.**

3301 Washington Blvd., St. Louis, Mo.



## New Low Prices On Fly Wheel Rings

Increased quantity production has enabled us to get out a new and lower price list on Meachem Steel Gear Rings for Fly Wheels. Also our trade discounts have been increased to more than offset the lower list prices. Write us for the new list and discounts.

**The Meachem Gear Corp'n.**  
Ring Dept. Syracuse, N. Y.

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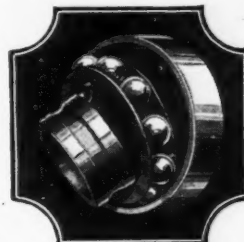
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## "NORMA" PRECISION BALL BEARINGS



Internationally recognized as  
the standard bearings for  
ignition apparatus and  
lighting generators

**THE NORMA COMPANY  
OF AMERICA**

Anable Avenue  
Long Island City New York  
BALL, ROLLER AND THRUST BEARINGS

## Every Guest Enjoys

the quiet dignity, the sincere and  
kindly service and the excellent ac-  
commodations of *The Hollenden*.  
Facing the New Federal Reserve  
Bank and the Six Million Dollar  
Public Auditorium, *The Hollenden*  
is at the center of the civic, social,  
commercial and financial activities  
of Cleveland. ~ ~ ~

Matured by years of service under  
the best principles, every guest re-  
ceives the welcome that brings  
travelers back to *The Hollenden* for  
its kindness and comfort. ~ ~

ROSCOE J. TOMPKINS, Manager

IN CLEVELAND  
-it's

# THE HOLLENDEN



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MARCH HAYNES, ASST. SECY. & TREAS.

# THE HAYNES AUTOMOBILE COMPANY

MANUFACTURERS OF

**HAYNES**  
MOTOR CARS

ADDRESS ALL COMMUNICATIONS  
TO THE COMPANY

**KOKOMO IND.**

Mr. Automobile Dealer:

You know that wise crack about nothing succeeding like success. And you know that there's a carload of solid sense in it.

If you are OVERSOLD, turning 'm away, you can (a) take your pick of the best salesmen, clamoring for a hitch-up with you, (b) take your pick of the best trades (make more money on every deal) AND (c) get the most favorable terms from local financial institutions which will be tickled to death to finance you.

You know this is so.

Now the Haynes Car and the Haynes MERCHANDISING PLAN are the combination that will put you in this happy position.

The HAYNES Car itself is a money-maker. By all odds the best money-making car that any dealer handles to-day. Ask Haynes dealers and they'll tell you so, straight from the shoulder.


Now our new Merchandising Plan will add at least 100% (get that one hundred per cent) to the certainty of your doing a turn 'm away business during 1924.

Please read that last paragraph again.

Wire for the plan.

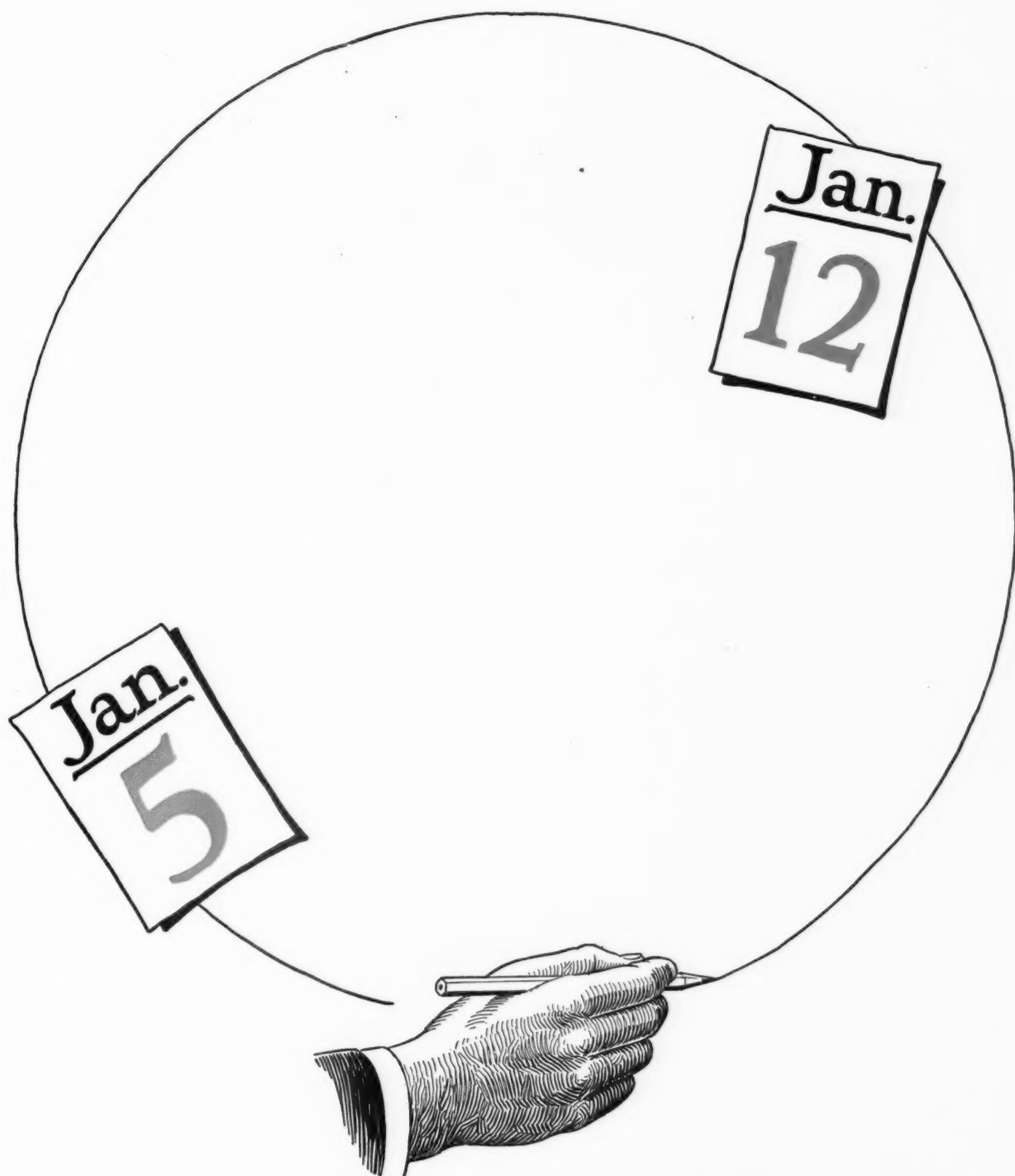
Yours for action,

THE HAYNES AUTOMOBILE COMPANY.



General Sales and Advertising Manager.

(Advertisement)



## **Rounding Out the Line —Watch Stutz Grow**

See the Stutz at the New York Show: 258th Field Artillery Armory, Space 3. Hotel Commodore lobby. Wm. Parkinson Motor Sales Company, 1796 Broadway.



*The Sign of the Genuine*

Dealers: A letter or wire will bring advance information. Territories are closing rapidly. Don't delay. Stutz Motor Car Company of America, Inc., Indianapolis, Ind.







## Winter Driving Is the Real Test

Now that winter is close at hand with its severe strain on automobile motors, the real test of reciprocating parts will begin. Piston Rings and Piston Pins must assume their share of the increased strain.

In starting, a cold motor is subject to a strain of approximately 65 pounds per square inch compression in the combustion chamber, also the intense heat created by the explosion of the gasoline. Quality Products only perform efficiently under these extreme conditions.

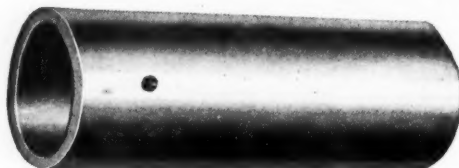
There is at least one sure way of playing safe. Identify yourself with GILL Quality Products by using GILL Pins in connection with Gill, Special and Servus Piston Rings.

GILL Inter-Locking Joint Piston Ring is the leader in the patented ring field. The specially constructed joint prevents any leakage at this point.

Special Oil-Wiper Piston Ring perfectly controls the lubrication of the cylinder walls.

Servus Step-Cut Ring meets the demand for a quality ring of this particular type.

*Prices, up to and including 4 inch—Gill 75c, Special 50c, Servus 30c*



GILL pins are made from solid bar stock and conform strictly to engine manufacturers' design and steel specifications. Perfect surface contact is assured by the fine degree of accuracy maintained at all stages of manufacture. Our grinding limits are two-tenths of one one-thousandth of an inch (.0002)

for taper and roundness and one-half of one one-thousandth (.0005) for size.

Complete stocks of standard and oversize pins for all engines are carried by jobbers and dealers in all sections of the country. In addition there are 26 Gill branches located in principal cities.

*Price list and specification book sent on request.*

### Gill Manufacturing Company

8300 South Chicago Ave.

Chicago, Ill.



# Gill

**Rings = Pins**